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AN ANALYSIS OF 874 CERVICAL CESAREAN SECTIONS PERFORMED AT THE CHICAGO LYING-IN HOSPITAL*

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THE performance of an increased number of cesarean sections has aroused great indignation, and warnings are repeatedly being sounded that the operation is being abused far too frequently. This is without a doubt true because the indications for cesarean section are often not carefully weighed, and many women are operated upon who should not be subjected to the risk of a laparotomy. On the other hand, some individuals want to extend the indications for abdominal delivery much further than is considered proper by most obstetricians. For example, Max Hirsch¹ of Berlin at the twentieth meeting of the Deutsche Gesellschaft für Gynäkologie in 1927 made a plea for an increase in the incidence of cesarean section as the best means to diminish the high maternal mortality which exists today. He advocated the substitution of cesarean section for all vaginal operative procedures except low forceps operations. His paper aroused a very lively and acrimonious discussion, and a large number of articles have been written in the German literature during the last two years in answer to Hirsch's arguments and statistics.

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NOTE: The Editor accepts no responsibility for the views and statements of authors as published in their "Original Communications."

In the present paper I have made an attempt to analyze all the cervical cesarean sections which have been performed at the Chicago Lying-In Hospital. This institution is an "open" one, and in addition to the attending staff about 140 outside physicians deliver patients in it. The first cervical cesarean section was performed at our hospital by Dr. DeLee on October 14, 1915, and from that day until July 1, 1929, the total number of these operations done was 874. In addition there have been 21 laparotrachelotomies followed by amputation of the uterus, but these are not included in my analysis because Porro operations and ruptured uteri should not be considered as ordinary

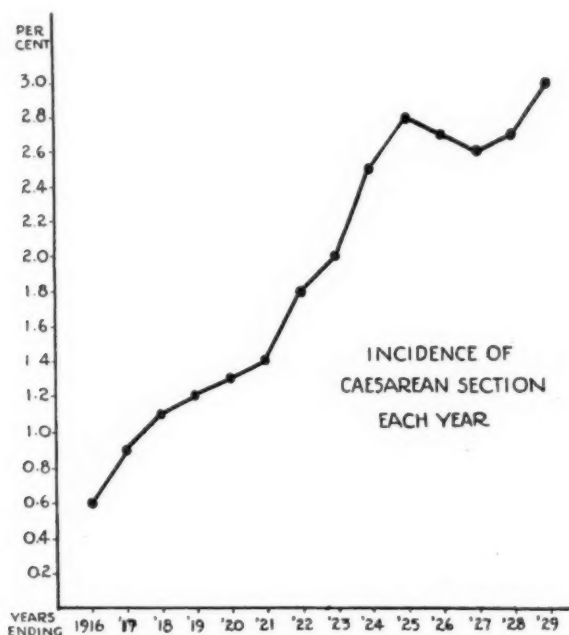


Fig. 1.

cesarean sections. During the same period of time there were 147 classic cesarean sections, and 17 additional classic operations were followed by removal of the uterus. The sum of all these abdominal deliveries is 1059. From July 1, 1915, to July 1, 1929, there were 32,797 deliveries in the hospital and 18,526 confinements supervised by our interns in the homes of patients. The latter patients are included in our statistics because all the out-patients who require cesarean sections, except the colored women, are sent to our hospital. Hence, among the 51,323 deliveries during the past fourteen years there were 1,059 abdominal deliveries, an incidence of 2.06 per cent, or one abdominal delivery among 48.5 patients (Table I).

TABLE I

No. of Deliveries in Hospital	July 1, 1915, to July 1, 1929	32,797
No. of Deliveries in Disp. Service	July 1, 1915, to July 1, 1929	18,526
		51,323
874 Cervical Cesarean Sections		
147 Classic Cesarean Sections		
21 Porro Operations after Cervical Cesarean Section		
17 Porro Operations after Classic Cesarean Section		
1059 Operations		
1059 operations among 51,323 cases—2.06%		
or 1 operation among 48.5 cases		

In Table II the incidence of the different types of abdominal delivery is listed for each year from 1915 to 1929. The increasing popularity of cesarean section at our hospital is graphically shown in Fig. 1.

TABLE II

YEAR	TOTAL DE- LIVERIES	CLASSIC CERVICAL CESAR- EANS	CESAR- EANS	PORRO OPERA- TIONS	TOTAL CESAR- EANS	INCIDENCE OF ALL CESAREANS	DELIVERIES PER CESAREAN
1915-16	2430	9	6	0	15	0.6%	162.0
1916-17	2134	12	6	2	20	0.9%	106.7
1917-18	2895	20	10	2	32	1.1%	90.5
1918-19	3393	20	21	1	42	1.2%	80.8
1919-20	3268	28	14	1	43	1.3%	76.0
1920-21	3362	14	30	2	46	1.4%	73.1
1921-22	3683	10	54	1	65	1.8%	56.7
1922-23	3886	9	68	1	78	2.0%	49.8
1923-24	4042	4	93	3	100	2.5%	40.4
1924-25	4312	6	109	4	119	2.8%	36.2
1925-26	4350	3	109	7	119	2.7%	36.6
1926-27	4307	3	102	8	113	2.6%	38.1
1927-28	4658	5	120	3	128	2.7%	36.4
1928-29	4603	4	132	3	139	3.0%	33.1
Total	51323	147	874	38	1059		

More than 85 per cent of the 874 laparotrachelotomies were performed by the six attending physicians, and the rest were done by sixteen additional physicians, most of whom are adjunct attending physicians or were resident physicians at the hospital.

The total number of maternal deaths among the 874 laparotrachelotomies was 11, an incidence of 1.26 per cent (Table III). Details of

TABLE III. MATERNAL DEATHS

	MORTALITY
11 deaths among 874 cervical cesarean sections	1.26%
Including 21 Porro operations	1.23%
7 deaths among 147 classic cesarean sections	4.76%
Including 17 Porro operations	4.27%
0 deaths among 38 Porro operations	

these cases will be given later. The total number of maternal deaths among the 147 classic cesarean sections, which were performed essen-

tially by the same operators, was 7, an incidence of 4.76 per cent. The cause of death in these cases was toxemia of pregnancy 3, peritonitis 2, heart disease 1, and abruptio placentae 1. There were no deaths among the 38 patients on whom Porro operations were performed. If the Porro operations are added to each group, the maternal death rate is 1.23 per cent for the cervical group and 4.27 per cent for the classic cases.

The total maternal mortality for the 1,059 abdominal deliveries was 1.7 per cent. The total mortality at our hospital from all cases after all types of delivery was 0.246 per cent for a series of 23,136 cases delivered between July 1, 1918, and July 1, 1927. The total fetal mortality among the 23,372 babies which weighed 1500 gm. or over in this series was as follows:

TABLE IV. FETAL DEATHS IN 23,136 DELIVERIES

	NO.	PER CENT
(1) Stillbirths including dead before admission (3) and nonviable monsters (4)	522	2.2
(2) Stillbirths excluding dead before admission (3) and nonviable monsters (4)	164	0.7
(3) Dead before admission	270	1.15
(4) Nonviable monsters	88	0.37
(5) Neonatal deaths	357	1.5

REPEATED CESAREAN SECTIONS

In our series of cervical cesarean sections, 631 patients had one, 106 women had two, 9 patients had three and one patient had four of these operations. Hence 127 of the 874 operations were repeated ones, an incidence of 14.5 per cent.

INDICATIONS FOR OPERATION

The indications for the 874 operations are shown in Table V.

Since the majority of the patients who previously had a cesarean section had contracted pelves, at least 50 to 55 per cent of the 874 operations were performed for cephalopelvic disproportion. Nevertheless, this incidence for contracted pelves is far lower than is generally reported.

A relatively large proportion of operations was done because of the toxemias of pregnancy, namely 9.7 per cent for the cases without convulsions and 1.8 per cent for eclampsia. This is due to the fact that in most cases of toxemia without convulsions we believe in emptying the uterus under local anesthesia if medical treatment does not produce improvement. In cases of eclampsia the pregnancy is ended as soon after the first convulsion as possible. The method selected is that which is safest for the mother. Cesarean sections were performed on only 18.5 per cent of all our eclamptic patients, and the rest were delivered vaginally.²

Among the 85 patients operated upon for preeclampsia, one had convulsions during the operation and six had convulsions during the puerperium.

Hemorrhage was the next most frequent indication, since 4.8 per cent of the operations were done for placenta previa and 3.2 per cent for abruptio placentae. We prefer the abdominal route for most cases of central or partial placenta previa where there has been much loss of blood, regardless of the condition of the child. A blood transfusion is given before, during or after the operation, and local anesthesia is used. Most of the patients with abruptio placentae who were subjected to cesarean section had a severe form of this condition.

TABLE V. INDICATIONS

	NO.	PER CENT
Cephalopelvic disproportion	368	42.1
Previous cesarean sections. No test of labor	99	11.3
Previous cesarean sections. Test of labor	57	6.5
Toxemia without convulsions	85	9.7
Eclampsia	16	1.8
Placenta previa	42	4.8
Abruptio placentae	28	3.2
Dystocia dystrophia syndrome	43	4.9
A number of previous stillbirths	37	4.2
Cardiac disease	29	3.3
Dystocia due to soft parts	19	2.2
Malpresentation in old primiparas	12	1.4
Tumors blocking pelvis	10	1.1
Threatened rupture of uterus	8	0.9
Pulmonary tuberculosis	4	0.46
Exophthalmic goiter	4	0.46
Antefixation of uterus	2	0.23
Prolapse of cord	2	0.23
High amputation of cervix	2	0.23
One kidney with pyelitis in it	1	0.11
Malformed uterus	1	0.11
Psychosis	1	0.11
Intrapartum skull fracture	1	0.11
Previous myomec omy	1	0.11
Enormous edema of labia	1	0.11
Tuberculous meningitis	1	0.11
	874	

Dystocia dystrophia syndrome as an indication for cesarean section requires elucidation. The term dystocia dystrophia syndrome is applied to a group of patients who have the following characteristics: The patient usually conceives for the first time relatively late in life or has one or more sad obstetric experiences. She is usually a heavy-set woman with some masculine features. The external pelvic measurements are usually large, but the available space within the pelvis is somewhat smaller than normal, and the extremities are short. The vagina is narrow and rigid, and the cervix is short and relatively firm. There may be a family history of dystocia and the patient's own history may reveal abnormalities in the sex life. There is a tendency to

toxemia. The patient usually goes beyond term, and the fetal head which is hard and generally in an occiput posterior position remains above the pelvic inlet even after many hours of labor. The membranes often rupture before the onset of pains, and the latter are usually weak and irregular. When delivery is attempted from below, the result is frequently disastrous to the child and injurious to the mother. In view of this danger it is occasionally advisable to perform a cesarean section to deliver a living and uninjured child and to avoid serious injury to the mother.

A large proportion of the patients who had a few stillbirths had contracted pelves and rightly belong in the group with cephalopelvic proportion. The 29 operations performed for heart disease indicate that we favor this operation in patients seriously ill because of heart trouble. The remainder of the indications require no explanation.

DURATION OF PREGNANCY

The duration of pregnancy is given in Table VI. It will be noted that 74 per cent of the patients were at term and 9.8 per cent were

TABLE VI. DURATION OF PREGNANCY

	NO.	PER CENT
More than ten lunar months	86	9.8
10 lunar months	647	74.0
9½ " "	55	6.3
9 " "	44	5.0
8½ " "	9	1.0
8 " "	16	1.8
7½ " "	8	0.9
7 " "	8	0.9
6 " "	1	0.1
	874	

TABLE VII. DURATION OF LABOR

	NO.	PER CENT
Not in labor	437	50.0
In labor	437	50.0
Less than 2 hours	18	38.1
2-6 hours	59	
6-10 hours	67	
10-15 hours	92	
15-20 hours	53	
20-25 hours	44	9.3
25-30 hours	18	
30-35 hours	21	
35-40 hours	20	
40-50 hours	22	
50-60 hours	7	1.5
60-70 hours	6	
72-96 hours	10	1.1

overterm at the time of operation. Cesarean sections before the eighth lunar month were performed in less than 2 per cent of the cases.

DURATION OF LABOR

As may be seen from Table VII, exactly half of the patients were in labor when the operation was performed. The same table shows that 38.1 per cent of all the patients were in labor from 1 to 25 hours, 9.3 per cent had labor pains from 25 to 50 hours, 1.5 per cent were in labor from 50 to 70 hours, and 1.1 per cent had labor pains from three to four days before the cesarean section was performed.

CONDITION OF MEMBRANES AT TIME OF OPERATION

Table VIII shows that the membranes had ruptured in only 21.4 per cent of the cases before operation. The table also shows the time which elapsed between the rupture of the membranes and the time of operation in these 187 cases. In 13.7 per cent of all the cases from 1 to 25 hours elapsed, in 2.8 per cent from 25 to 50 hours, and in 0.7 per cent from 50 to 72 hours intervened before the operation was done. Vaginal examinations before operation were made on 81 patients (9.3 per cent) and the number of these manipulations varied from one to ten. In three cases forceps had been applied, in two cases gauze had been used to induce labor, in two cases labor had been induced with a colpeurynter, and in one case the cord had been manually replaced in the uterine cavity before the cesarean section was done. In an additional case where forceps had been applied, a Porro operation was performed.

TABLE VIII. CONDITION OF MEMBRANES AT TIME OF OPERATION

	NO.	PER CENT
Not ruptured	687	78.6
Ruptured	187	21.4
Less than 2 hours	8	13.7
2-6 hours	36	
6-10 hours	25	
10-15 hours	23	
15-20 hours	10	
20-25 hours	18	2.8
25-30 hours	7	
30-35 hours	4	
35-40 hours	4	
40-45 hours	6	
45-50 hours	4	0.7
50-60 hours	3	
60-72 hours	3	
4 days	1	
5 days	1	
8 days	1	
Time not stated	33	

PREVIOUS LABORS

The previous labors which were abnormal are listed in Table IX. It will be seen that 106 patients had one, 9 patients had two and one patient had three previous cervical cesarean sections. Furthermore 65 women had one, 2 women had two and one woman had 3 classic cesarean operations. The total number of patients who previously had laparotrachelotomies only, is 116; the number who had classic cesarean sections only is 70, and 4 had both types of operation. This gives a total of 190 women who had more than one cesarean section. The vast majority of the 74 classic operations had been performed in other hospitals. It is interesting to note that 167 patients previously gave birth to stillborn children or children which died shortly after birth, and on twenty-four babies a craniotomy had been performed.

TABLE IX. PREVIOUS LABORS

One cervical cesarean section	106	}	116	}	190
Two cervical cesarean sections	9				
Three cervical cesarean sections	1				
One classic cesarean section	65	}	70		
Two classic cesarean sections	2				
Three classic cesarean sections	1				
One classic cesarean section then forceps	2	}	4		
One classic and one laparotrachelotomy	2				
Two classic and one laparotrachelotomy	2	}	4		
Vaginal cesarean section	1				
Pubiotomy	1				
Dead babies	167				
Craniotomy	24				
Ectopic pregnancy	6				
Hydatid mole	1				

ANESTHETIC

The type of anesthetic employed is shown in Table X. Ether alone was used in 35.8 per cent of all the cases, novocaine alone in 55.1 per cent, novocaine with a small amount of ether or gas in 6.1 per cent, ethylene and oxygen in 2.6 per cent, and nitrous oxide and oxygen in 0.4 per cent. During the past year 92 per cent of all the operations were performed under local anesthesia.

TABLE X. ANESTHETIC

	NO.	PER CENT
Ether	313	35.8
Novocaine only	482	55.1
Novocaine and ether or gas	53	6.1
Ethylene and oxygen	23	2.6
Nitrous oxide and oxygen	3	0.4

From July 1, 1928, to July 1, 1929, 92 per cent of all the laparotrachelotomies were performed under local anesthesia.

ADDITIONAL OPERATIONS

Table XI shows what additional operations were performed at the time of cesarean section. Sterilization by means of an operation on the fallopian tubes was performed on 84 patients, or 9.6 per cent of all the patients. If the Porro operations are included, the incidence of sterilization is 11.7 per cent. Myomectomy was done 11 times, repair of a hernia 3 times, appendectomy twice, removal of an ovarian cyst once, and removal of a septum in the uterus once.

In the eleven cases where myomectomy was performed, the fibroids were not the indication for the cesarean section. We performed cesarean sections because of myomata of the uterus nine times altogether, but in all of the cases the fibroids were large enough to justify a Porro operation.

TABLE XI. ADDITIONAL OPERATIVE PROCEDURES

	NO.	PER CENT
Sterilization	84	9.6
If the Porro operations are included the incidence is	105	11.7
Myomectomy	11	
Repair of hernia	3	
Appendectomy	2	
Removal of ovarian cyst	1	
Removal of septum in uterus	1	

STERILIZATION

Of the 84 sterilization operations, 36 were done after the first cesarean section, which gives an incidence of 5.7 per cent for the 631 first laparotrachelotomies. There were 39 sterilization operations after the second cesarean section, an incidence of 36.8 per cent for the 106 second laparotrachelotomies, and 8 women, or 88.9 per cent, of the 9 women who had three laparotrachelotomies were sterilized after the third cesarean section. The patient who had four cesarean sections was sterilized after the last one (Table XII).

TABLE XII. STERILIZATION

		NO.	PER CENT
After first laparotrachelotomy	(631)	36	5.7
After second " "	(106)	39	36.8
After third " "	(9)	8	88.9
After fourth " "	(1)	1	100.0
		84	

The 36 women who were sterilized after the first cesarean section had the following number of living children including the baby delivered by laparotrachelotomy: 16 had one child, 10 had two, 4 had three, 3 had four, 1 had five, and 2 had six children. Of the 16 women who

had only one child, 11 were sterilized after the first full-term pregnancy, whereas the other five had had one or more stillbirths or neonatal deaths. The reasons for terminating the reproductive function after the first full-term pregnancy were as follows: cardiac disease 6, pulmonary tuberculosis 2, ventrofixation of the uterus 1, one kidney with pyelitis in it, and five previous laparotomies 1, and one patient forty-two years of age desiring sterilization.

MATERNAL MORTALITY

The total maternal mortality for the 874 operations was 1.26 per cent. Following are brief notes about each of the eleven deaths:

CASE 1.—Mrs. W., No. 7959, operated upon July 5, 1919, primipara, forty-two years of age. In labor sixty hours and membranes ruptured thirty hours. Blood pressure 204/138 mm. Weight 278 pounds. Disproportion between head and pelvis. Meconium escaping but fetal heart tones good. Laparotrachelotomy under ether done at request of patient for religious reasons. Bladder punctured during operation but closed at once and drained. Death from peritonitis four days after operation. No autopsy. Baby lived.

CASE 2.—Mrs. Z., No. 35059, operated upon April 4, 1924. Primipara, age seventeen years. Justo minor pelvis. In labor four days. Laparotrachelotomy under ether. Patient took anesthetic badly. Pneumonia developed first day after operation. Secondary peritonitis and septicemia. Died on eighth postpartum day. Autopsy showed bilateral hemorrhagic bronchopneumonia, acute pulmonary edema, acute bilateral diaphragmatic pleurisy and acute diffuse peritonitis. Baby lived.

CASE 3.—Mrs. J., No. 39758, operated upon Dec. 14, 1924, under ether. Primipara, age nineteen years. In labor two days. At time of operation blood pressure was 146/104 mm. and temperature 100.4° F. Large baby. Eight hours after operation temperature was 102.5° F. Signs and symptoms of pneumonia. Peritonitis followed at once. Abdominal drainage. Blood transfusion followed by jaundice, anuria and uremia. Death on tenth day. Baby weighed 4060 gm., lived.

CASE 4.—Mrs. S., No. 47438, operated upon under local anesthesia Jan. 10, 1926. Primipara, age twenty-six years. Considerable vomiting in early months of pregnancy. At time of operation eight months pregnant. Edema of ankles for last two months. Did not follow instructions. Entered hospital under protest. Blood pressure 180/110 mm. Urine turned solid on boiling. Headaches and mental aberration. Convulsions began forty-one hours after operation. Eleven convulsions in rapid succession with death twenty hours after first convulsion. Autopsy denied. Abdominal incision opened. No peritonitis. Baby alive.

CASE 5.—Mrs. M., No. 48105, a tertipara, age twenty-six years, had her third laparotrachelotomy on March 28, 1926. Novocaine, ethylene and ether used. Patient had bilateral phlegmasia alba dolens after first cesarean section and paralytic ileus after the second. Advised against further pregnancies. Pronounced anemia and paroxysmal tachycardia during all three pregnancies. Immediately after third cesarean section, paralytic ileus and infection in abdominal wall. General streptococcus peritonitis. Death on eighth day. Autopsy showed uterus and cesarean wound to be perfectly healthy. General peritonitis most marked in region of

appendix, cecum and right cornua of uterus from which a portion of the tube had been resected for sterilization. Baby lived.

CASE 6.—Mrs. G., No. 51670, a primipara, age twenty-one years, was operated upon Aug. 13, 1926, under local anesthesia. No prenatal care. Entered hospital with blood pressure of 164/104 mm., marked albuminuria, enormous edema of legs and labia. Not in labor. Convulsions before and after operation. No peritonitis but general septicemia beginning apparently in whole operative field. Died on twelfth day. Partial autopsy. Blood cultures showed hemolytic streptococci. Baby alive.

CASE 7.—Mrs. C., No. 57924, a thirty-four-year-old secundipara had a laparotrachelotomy under local anesthesia for the second time on July 10, 1927. Weight 280 pounds, masculine pelvis, fibroids and extreme obesity. Membranes ruptured forty-eight hours before admission. Temperature of 100° F. at time of operation. Baby and cavity of uterus had foul odor. Baby had pustules on scalp and temperature of 102° F. at birth. It died of general sepsis on fourth day and mother died of peritonitis on fifth day.

CASE 8.—Mrs. D., No. 60514 and 60825, a primipara, age thirty years, had a laparotrachelotomy under local anesthesia on Nov. 27, 1927, because of abruptio placentae and a face presentation. Recovery was uneventful. The highest temperature was 100° F., and the patient left the hospital on the fourteenth day. Four hours after returning home, had pain in the right side of chest. Two days later temperature up to 103° F. Readmitted to hospital five days afterward. Mild elevation of temperature in hospital. After four days of normal temperature, got out of bed but died suddenly. Autopsy showed wound in uterus to be clean, pulmonary embolism in small accessory lobe of right lung and retrograde thrombosis into right side of heart. Source could not be found. Baby a monstrosity. Lived four weeks.

CASE 9.—Mrs. S., No. 62084, operated upon April 17, 1928, para vii, age twenty-six years. Cesarean section because of abruptio placentae, chronic nephritis and hypertension. Local anesthesia used. Fetus weighed only 1490 gm., and placenta had foul odor. In shock. Blood transfusion. Did well for a few days, then abscess developed in right iliac fossa. Opened abdominally and vaginally. Septicopyemia for six weeks. Autopsy showed infection of wound, well localized, also gangrenous appendicitis with a pericecal abscess, an abscess around the duodenum, and pelvic thrombophlebitis.

CASE 10.—Mrs. H., No. 70261, a primipara, age twenty-three years, was operated upon April 14, 1929. Entered hospital at term with history of severe headaches, anorexia, vomiting and emaciation. Treated for hyperemesis. Fever developed and condition grew worse. Laparotrachelotomy under local anesthesia followed by typical course of meningitis. Tubercle bacilli found in spinal fluid. Death on sixth post-operative day. Autopsy refused. Wound clean. Baby alive.

CASE 11.—Mrs. B., No. 70026, a primipara, age twenty-one years. Laparotrachelotomy on May 31, 1929, because of mitral and aortic stenosis and insufficiency and justo minor pelvis. Elective operation at term under local anesthesia. Temperature up to 102° F., thirty hours after operation. Pelvic cellulitis extending around rectum and involving whole pelvis during an illness of nine weeks. Free drainage. Three blood transfusions. Death from sepsis. Child alive but has mild hydrocephalus.

The causes of death in the above eleven cases may be listed as follows (Table XIII):

TABLE XIII. CAUSE OF MATERNAL DEATHS (11 IN 874, OR 1.26 PER CENT)

Peritonitis	3
Pneumonia (after ether)	2
Sepsis	1
Gangrenous appendicitis	1
Pulmonary embolism	1
Eclampsia (antepartum)	1
Eclampsia (postpartum)	1
Tuberculous meningitis	1
	<hr/> 11

The maternal mortality arranged according to the indications for operation is shown in Table XIV.

TABLE XIV. MATERNAL MORTALITY ACCORDING TO INDICATION

INDICATION	NO. OF OPERATIONS	MATERNAL DEATHS	
		NO.	PER CENT
Cephalopelvic disproportion	368	3	0.8
Repeated laparotrachelotomy	127	2	1.6
Toxemia without convulsions	85	1	1.2
Eclampsia	16	1	6.3
Placenta previa	42	0	0
Abruptio placentae	28	2	7.1
Cardiac disease	29	1	3.4
Tuberculous meningitis	1	1	100.0
Dystocia dystrophia syndrome	43	0	0
Total	874	11	<hr/> 1.26

It may be seen from the table that the mortality for patients having their first laparotrachelotomy for cephalopelvic disproportion was 0.8, whereas for those having their second or third operation it was twice as high. Nevertheless, the mortality following repeated cesarean section (1.6 per cent) is not much higher than it is for the entire series (1.26 per cent). Furthermore, the two patients in the series of repeated operations who died should not have been operated upon. The first case (Case 5) had very troublesome recoveries after her first two cesarean sections and was urged not to become pregnant again, and the second patient (Case 7) clearly had an infection at the time of operation. The death rate for toxemia without convulsions was 1.2 per cent, and for eclampsia it was 6.3 per cent. There was not a single maternal death among the 42 patients operated upon for placenta previa, and if we add to these the two patients who had Porro operations for this condition, we have 44 operations for placenta previa with no maternal mortality. (Parenthetically I may add that our mortality for placenta previa with the so-called conservative methods of treatment is 3.9 per cent.⁴) There were two deaths among the 28 patients who had abruptio placentae, a mortality rate of 7.1 per cent. If we

add the two Porro operations performed for this type of hemorrhage the death rate is reduced to 6.7 per cent for the 30 cases. All the patients in this group were seriously ill at the time of operation. The death which is listed among the 29 cardiac patients was due to sepsis and not to the heart condition for which the operation was performed (Case 11).

MORBIDITY

The standard of morbidity at the Chicago Lying-In Hospital is a very rigid one. We consider as morbidity every elevation of temperature to 100° F. or above, even if recorded but once, from the moment of delivery until the discharge of the patient from the hospital. Our morbidity for all the cases after all types of delivery among 23,136 deliveries in the hospital from July 1, 1918, to July 1, 1927, was 10.8 per cent. Under the morbidity standard of the British Medical Association it was only 4.3 per cent. Among the 874 cesarean operations 379, or 43.4 per cent, were recorded as febrile by our standard. Table XV shows how high the elevations in temperature were.

TABLE XV. FEVER (IN 379 OUT OF 874 CASES OR 43.4 PER CENT)

100 - 100.5 degrees F.	67
100.5 - 101 " "	114
101 - 101.5 " "	45
101.5 - 102 " "	69
102 - 102.5 " "	18
102.5 - 103 " "	26
103 - 103.5 " "	7
103.5 - 104 " "	16
104 - 105 " "	10
Higher than 105 " "	7
	<hr/> 379

CAUSE OF FEVER

In 196 cases the cause of fever was known, but in 183 cases no etiology could be ascertained. Most of the latter patients had a mild elevation, between 100° and 101° F.

The causes for the fever in the 196 cases are listed in Table XVI.

An incidence of 6.1 per cent for infected wounds after laparotomies is not high. Among these cases were two in whom eventration of the viscera occurred.⁵ A frequency of 4.8 per cent for pyelitis and cystitis requires analysis. Fourteen of the 42 cases of pyelitis and cystitis occurred among the 101 patients who had toxemia; hence, the incidence of pyelitis for this group was 13.9 per cent. In not one of the 16 eclamptic patients was pyelitis a complication; hence, the frequency of these urinary complications among the toxemic patients without convulsions was 16.5 per cent. This high frequency indicates that there is a definite relationship between the toxemias of pregnancy and

the development of pyelitis and most likely other renal complications. We have not infrequently observed that patients who have pyelitis during pregnancy develop symptoms of preeclampsia or eclampsia toward the end of gestation. In fact two of the patients in this series listed as having had pyelitis after operation had pyelitis during pregnancy, and in both cases the indication for the cesarean section was preeclampsia.

TABLE XVI. CAUSE OF FEVER (KNOWN IN 196 CASES)

	NO.	PER CENT OF 874 CASES
Infected wound	53	6.1
Pyelitis and cystitis	42	4.8
Bronchitis	18	2.1
Pneumonia	11	1.3
(only one after local anesthesia)		
Grip	9	1.0
Endometritis	8	0.9
Lochiometra	8	0.9
Peritonitis	6	0.7
Mastitis	6	0.7
Phlegmasia alba dolens	6	0.7
Laryngitis and tonsillitis	5	0.57
Breast abscess	4	0.46
Pulmonary tuberculosis	4	0.46
Cholecystitis	3	0.34
Abscess from hypodermic	3	0.34
Toxic erythema	3	0.34
Pelvic abscess	2	0.23
Hematoma in rectus muscle	2	0.23
Acute appendicitis	2	0.23
Sinusitis	2	0.23
Pulmonary abscess	1	0.11
Hyperthyroidism	1	0.11
	196	

The incidence of pyelitis at our hospital in cases not subjected to cesarean section is extremely low. Among 23,136 patients there were 104 cases of pyelitis and cystitis including those which followed cesarean section. This incidence is only 0.45 per cent. Tansinsin,⁶ however, reported an incidence of 2.46 per cent in 446 consecutive obstetric cases at St. Margaret's Hospital in Pittsburgh.

The frequency of bronchitis, pneumonia and gripe is not unusual. It is interesting to note that only one of the eleven cases of pneumonia followed the use of local anesthesia, in spite of the fact that local anesthesia alone was used in 55.1 per cent of all the cases. Three of the six patients who had peritonitis died (50 per cent). The other complications require no special discussion.

STAY IN HOSPITAL

Table XVII shows the length of time the patients remained in the hospital after operation. It may be seen that 46.7 per cent left the hospital within 14 days, and 84.6 per cent went home within 18 days.

TABLE XVII. STAY IN HOSPITAL

8 days	1	} 403 cases or 46.7%	} 730 cases or 84.6%
10 days	9		
11 days	24		
12 days	76		
13 days	123		
14 days	170		
15 days	139	} 327 cases or 37.9%	
16 days	84		
17 days	58		
18 days	46		
19 days	24		
20-25 days	60		
26-30 days	27		
31-35 days	6		
36-40 days	5		
41-50 days	5		
51-60 days	3		
61-70 days	2		
84 days	1		
	<hr/> 863		

FETAL MORTALITY

Since there were 13 twins, the total number of babies delivered was 887. There were 40 stillbirths and neonatal deaths, an incidence of 4.5 per cent. In Table XVIII the deaths are recorded according to the indication for the operation. Of the twelve deaths listed among the patients with cephalopelvic disproportion, 3 were due to atelectasis, 2 babies were monsters, 1 died of congenital heart disease, 1 of anemia, 1 of an infected umbilicus, 1 of enlarged thymus and in 3 cases the cause of death was unknown. Of the 7 deaths listed for those who had toxemia without convulsions, 5 were due to prematurity, 1 to congenital heart disease, and one baby had toxemia similar to that in the mother. There was not a single fetal death among the patients who had eclampsia. The causes of death in the 10 cases of placenta previa were prematurity in 4, atelectasis in 4, and 2 babies were

TABLE XVIII. FETAL MORTALITY ACCORDING TO INDICATION

INDICATION	NO. OF BABIES	FETAL DEATHS	
		NO.	PER CENT
Cephalopelvic disproportion	368	12	3.3
Placenta previa	42	10	23.8
Abruptio placentae	28	10	35.7
Toxemia without convulsions	93	7	7.5
Psychosis	1	1	100.0
Repeated laparotrachelotomy	129	0	0
Eclampsia	16	0	0
Cardiac disease	30	0	0
Dystocia dystrophica syndrome	43	0	0
Previous stillbirths	40	0	0
Total	890*	40	4.5

*Fourteen twins and one set of triplets.

monsters. (A few years ago I pointed out that the association of placenta previa and monstrosities was not an accidental one.⁷) In the cases of abruptio placentae, death occurred in utero before operation in nine instances, and the tenth baby had atelectasis. Prematurity was the cause of death in the baby born of the mother with a psychosis. There were no fetal deaths in the series of repeated laparotrachelotomies.

In Table XIX the fetal deaths are listed according to etiology and not according to the indication for cesarean section. All nine babies which died before the operation was performed were in the abruptio placentae series. The chief causes of death in the remaining cases were prematurity 25 per cent, atelectasis 20 per cent, monstrosities 10 per cent, and congenital heart disease 5 per cent.

TABLE XIX. ANOTHER CLASSIFICATION OF FETAL DEATHS

	NO. PER CENT	
Dead before operation	9	22.5 (All in cases of abruptio placentae)
Premature	10	25.0 { 4 in cases of placenta previa 5 in cases of preeclampsia 1 in case of psychosis
Atelectasis	8	20.0 { 4 in cases of placenta previa 3 in cases of cephalopelvic disproportion 1 in case of abruptio placentae
Monstrosity	4	10.0 { 2 in cases of placenta previa 2 in cases of cephalopelvic disproportion
Congenital heart disease	2	5.0 { 1 in case of preeclamptic toxemia 1 in case of cephalopelvic disproportion
Anemia	1	2.5 (In case of cephalopelvic disproportion)
Infected umbilicus	1	2.5 (In case of cephalopelvic disproportion)
Enlarged thymus	1	2.5 (In case of cephalopelvic disproportion)
Toxemia in baby	1	2.5 (In case of preeclamptic toxemia)
Unknown	3	7.5 (All in cases of cephalopelvic disproportion)
	40	

PORRO OPERATIONS

In Table XX some information is given concerning the 21 Porro operations.

All the mothers recovered and all the babies which were alive at the time the operation was performed left the hospital alive. The two fetal deaths were in cases of abruptio placentae. In 9 of the 21 operations the indication was fibroids of the uterus. In the two cases listed as abruptio placentae, the uteri showed uteroplacental apoplexy which made hysterectomy imperative. Some of the remaining indications may not seem justifiable ones; but since we know that a patient usually has an uneventful convalescence after a Porro operation, it is sometimes discreet to amputate the uterus in certain cases

where sterilization is contemplated. We have not been unduly radical, for in the series of 895 cervical cesarean sections (874 plus 21), the uterus was amputated in only 2.3 per cent of the cases. Eleven women were over thirty-five years of age, and whereas eight women had only one living child, each of the rest had from two to eleven children.

TABLE XX. 21 PORRO OPERATIONS

Maternal death rate	0	} Both deaths due to abruptio placentae
Fetal death rate (2)	9.5%	
<i>Indications</i>		
Fibroids		9
Abruptio placentae		2
Carcinoma of rectum		1
Mishandling with forceps		1
Placenta previa in para vi		1
Placenta previa in para vii		1
Third cesarean section		1
Fourth cesarean section		1
Three almost fatal postpartum hemorrhages		1
Severe toxemia in two pregnancies		1
Cardiac disease with menstrual disturbances in a para vi		1
Second cesarean section with severe infection after the first one		1
		<hr/> 21
Eleven women were over 35 years of age.		
Parity varied from 1 to 11.		

VAGINAL DELIVERIES AFTER LAPAROTRACHELOTOMY

We do not know of a single instance where a patient had a rupture of the uterus following one of our laparotrachelotomies. On the other hand we have records of 22 vaginal deliveries after our operations. Among these, four patients have each had two vaginal deliveries after a cervical cesarean section, one patient had a vaginal delivery after two laparotrachelotomies and one patient had two deliveries through the vagina after two cervical operations.

ADVANTAGES OF LAPAROTRACHELOTOMY

The frequency with which the low or cervical type of cesarean section has been performed at the Chicago Lying-In Hospital indicates that it is the operation of choice when delivery is to be accomplished through the abdomen. In fact during the last eight years, the classic operation has seldom been performed except preliminary to a Porro operation.

We believe the cervical type of cesarean section is far superior to the classic type for the following reasons:

1. It has a decidedly lower maternal mortality. The mortality rate of the Chicago Lying-In Hospital is very low. I personally have performed 109 consecutive cervical cesarean sections, without a single maternal death.

2. The morbidity is also definitely lower. The decreased mortality and morbidity may be attributed to a number of factors. The incision after closure heals better because it is not in the contractile portion of the uterus but in the lower uterine segment which is at rest. The sutures need not be pulled tightly because they are used essentially for the purpose of approximation of the wound edges and not for hemostasis. The incision is covered over completely with peritoneum, which is a very important barrier against infection. The lower uterine segment resists infection better than the fundus. Perhaps one of the reasons for this is the presence of a large number of macrophages beneath its peritoneal covering and in the bases of the broad ligaments especially in the presence of infection as shown by Hofbauer⁸ and by Fluhmann.⁹

3. The cervical operation may safely be performed after a long test of labor, at which time the classic operation is fraught with great danger.

4. It guarantees a much greater protection against rupture of the uterus in subsequent pregnancies and labors. The incidence of rupture of the uterus after classic operations varies from 1 to 4 per cent, and a fair proportion of these accidents occurs during pregnancy when trouble is not anticipated. On the other hand, there have been reported in the entire world literature only 22 cases of rupture of the uterus after the cervical type of operation. All but three of these occurred during active labor. This is a negligible percentage of all the laparotrachelotomies performed all over the world.

In a study of 37 uterine scars removed from patients who returned for subsequent cervical cesarean sections, Bloom and I¹⁰ found that in most cases the wounds had healed well and that even in the cases where the scars were anatomically weak, they withstood the distention produced by pregnancy and the strain of labor. This is well exemplified by the fact that in our series of 874, as far as we know, there was not a single case of rupture of the uterus.

The technic of the operation as we perform it at the Chicago Lying-In Hospital need not be detailed here because it has already been described by Dr. DeLee¹¹ and by me.³ In all but four of the operations in the present series the longitudinal incision in the lower uterine segment was employed. In four cases the incision was made transversely. The operation is not much more difficult than the classic one, and its safety is still more enhanced by the use of local anesthesia.¹² Even Porro operations may be performed under direct infiltration anesthesia.¹³

SUMMARY

In this paper information is given concerning 1059 cesarean sections of all types which were performed at the Chicago Lying-In Hospital from July 1, 1915, to July 1, 1929. Since there were 51,323 deliveries

at this hospital and its dispensary services, the incidence of abdominal delivery for the last fourteen years was 2.06 per cent, or one cesarean section for every 48.5 cases.

The maternal mortality for the 874 cervical operations was 1.26 per cent. If the 21 Porro operations which were performed after a laparotrachelotomy are added, the death rate is 1.23 per cent. For the 147 classic cesarean sections, the mortality was 4.76 per cent and this is reduced to 4.27 per cent if the 17 Porro operations, which were done after a classic cesarean section, are added.

All of the figures quoted in this paper are gross figures. None of the statistics was "corrected." The following information is based only upon the 874 cervical operations.

The chief indications for the laparotrachelotomies were cephalopelvic disproportion 42.1 per cent, previous cesarean section with test of labor 11.3 per cent, previous cesarean section without test of labor 6.5 per cent, toxemia without convulsions 9.7 per cent, eclampsia 1.8 per cent, placenta previa 4.8 per cent, abruptio placentae 3.2 per cent, dystocia dystrophica syndrome 4.9 per cent, a number of previous stillbirths 4.2 per cent, and cardiac disease 3.3 per cent.

Only 50 per cent of the patients were in labor at the time of operation, and of these 38.1 per cent had labor pains between 1 and 25 hours, 9.3 per cent had pains between 25 and 50 hours, and 2.6 per cent had been in labor from two to four days.

In 21.4 per cent of the cases, the membranes were ruptured when the cesarean section was performed, and the interval between the rupture of the membranes and the time of operation varied from one hour to eight days.

Ether was the anesthetic employed in 35.8 per cent of the cases, novocaine alone in 55.1 per cent, novocaine with ether or gas in 6.1 per cent, ethylene in 2.6 per cent and nitrous oxide in 0.4 per cent. During the past year 92 per cent of all the cesarean sections were performed under local anesthesia.

Sterilization by means of operations on the fallopian tubes was performed in 9.6 per cent of all the cases. If the Porro operations are included, the incidence of sterilization was 11.7 per cent.

The cause of death in the 11 fatal cases was as follows: peritonitis 3, pneumonia (after ether) 2, sepsis 1, gangrenous appendicitis 1, pulmonary embolism 1, antepartum eclampsia 1, postpartum eclampsia 1, and tuberculous meningitis 1.

The maternal mortality according to the indications was as follows: cephalopelvic disproportion 0.8 per cent, repeated laparotrachelotomy 1.6 per cent, toxemia without convulsions 1.2 per cent, eclampsia 6.3 per cent, placenta previa no deaths, abruptio placentae 7.1 per cent, cardiac disease 3.4 per cent, and tuberculous meningitis 100 per cent.

Fever after operation was present in 43.4 per cent of the cases. The main causes of pyrexia in the 196 cases where the etiology was known, were infected wounds 6.1 per cent, pyelitis and cystitis 4.8 per cent, bronchitis 2.1 per cent, pneumonia 1.3 per cent, grip 1.0 per cent, endometritis 0.9 per cent and lochiometra 0.9 per cent.

In 46.7 per cent of the cases the patients left the hospital within fourteen days after operation and in 84.6 per cent they went home within eighteen days.

The fetal mortality according to the indications for the operation was as follows: cephalopelvic disproportion 3.3 per cent, repeated laparotrachelotomy no deaths, toxemia without convulsions 7.5 per cent, eclampsia no deaths, placenta previa 23.8 per cent, abruptio placentae 35.7 per cent, and psychosis 100 per cent. The chief causes of death among the 40 infants were as follows: dead before operation 22.5 per cent, prematurity 25 per cent, atelectasis 20 per cent, monsters 10 per cent, and congenital heart disease 5 per cent.

Among the 21 patients who had Porro operations there were no maternal deaths and two fetal deaths (9.5 per cent).

I desire to thank Mrs. G. H. Harries, registrar of the Chicago Lying-In Hospital for her valuable assistance in collecting data from the original case histories.

REFERENCES

- (1) *Hirsch, M.*: Zentralbl. f. Gynäk. 51: 2215, 1927. (2) *Greenhill, J. P.*: J. A. M. A. 87: 228, 1926. (3) *Greenhill, J. P.*: Internat. Clin. 4: 171, 1925. (4) *Greenhill, J. P.*: Surg. Gynec. & Obst. 50: 113, 1930. (5) *Horner, D. A.*: J. A. M. A. 93: 1126, 1929. (6) *Tansinsin, M. S.*: AM. J. OBST. & GYNEC. 18: 98, 1929. (7) *Greenhill, J. P.*: Surg. Gynec. & Obst. 36: 227, 1923. (8) *Hofbauer, J.*: Bull. Johns Hopkins Hosp. 38: 255, 1926. (9) *Fluhmann, C. F.*: AM. J. OBST. & GYNEC. 15: 783, 1928. (10) *Greenhill, J. P., and Bloom, B.*: J. A. M. A. 92: 21, 1929. (11) *DeLee, J. B.*: J. A. M. A. 84: 791, 1925. (12) *DeLee, J. B.*: Surg. Gynec. & Obst. 40: 230, 1925. (13) *Greenhill, J. P.*: J. A. M. A. 90: 1023, 1929.

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(For discussion, see page 698.)

OBSERVATIONS AND CONCLUSIONS ON PLASTIC OPERATIONS IN GYNECOLOGY*

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IT IS my purpose to present in the paper which follows some of my observations and my practice in the performance of vaginal plastic operations in the clinic of the Woman's Hospital where I have been associated for the past eight years. The experiences encountered during this period have been most interesting and instructive, and I wish at the outset to acknowledge my genuine gratitude to the chief surgeon and to other senior members of the staff for the opportunity to study and compare their several excellent methods of work.

A thorough knowledge of the anatomy of the pelvic organs and particularly of their surrounding fascial structures is admittedly a prerequisite to the intelligent handling of all conditions where plastic repair is indicated. At the same time it cannot be denied that there has been an extraordinary amount of detailed and often confusing description of the musculofascial planes in this region. The result is that the beginner, and even the man of practical experience, is often despairingly confused when he undertakes their study.

Among the most lucid descriptions of these structures to be found in English may be mentioned the papers of Frank, Ward, Bissell and Goff and Farrar's chapter in the recent Kelly's *Gynecology*. All of these quote freely from the European observers, Martin, Tandler, Halban and others, and offer admirable illustrations. A perusal of these papers brings out the following facts which may be regarded as salient and quite indispensable to the discerning surgeon.

The two distinct systems concerned in the support of the female generative organs, as well as of the urinary bladder and the rectum, are the lower or supporting apparatus and the upper or holding apparatus. The first of these two groups consists of the levator ani and coccygeus muscles with their fascial investments and the triangular ligament in which is ensheathed the deep transversus perinei. This supporting apparatus, called sometimes the pelvic diaphragm, has been aptly likened by Frank to the shock absorbers in a mechanical device and, in my opinion, plays an important coordinating, but none the less minor, part in the prevention of prolapse of the uterus and vaginal walls. The major factors operating to control normal relations are the numerous musculofascial planes radiating in all directions from the upper part of the cervix, and it is to these structures that the term "holding apparatus" has been applied. This division Frank has again

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likened to an elastic sling or set of springs which maintains the uterus in labile equilibrium in the pelvis. These fascial planes include all the pelvic fascias which do not make investments for the muscle structures named above and are continuations of the endopelvic and in turn of the endoabdominal fascia.

This endopelvic fascia, so completely described by Halban, forms an investiture for all the pelvic organs including bladder, vagina and rectum, and certain areas of it may be given distinctive names which serve to designate their locations. It seems to me that the most important of these special areas or layers are: (1) the vesicovaginal layer; (2) the cardinal or, better, the transverse cervical ligaments; (3) the rectovaginal layer; and (4) sacrouterine ligaments. The so-called cardinal ligaments are the numerous strong reduplications of endopelvic fascia radiating fanwise from the upper cervix to the lateral walls of the pelvis and are the strongest part of the holding sling. The other three divisions are situated in the regions which their titles would suggest. The round and broad ligaments are quite generally admitted to contribute little or nothing to maintaining the uterus at a fixed level in the pelvis, and if they function at all in this respect, their rôle is distinctly a subsidiary one. On the other hand the round ligaments play a major part in tilting forward the uterus and maintaining that organ in its normal attitude of anteversion.

The injuries incident to parturition are injuries of the various structures enumerated above, and according to the areas affected one is able to recognize the clinical conditions to which definite names have been applied. For the sake of classification and clearer thinking in dealing with the individual case one may bear in mind six distinct regions which are liable to injury and the six conditions which respectively are a result of defects in them. They are as follows:

(1) Injury to the upper anterior vaginal wall and its contiguous endopelvic fascial layer resulting in cystocele.

(2) Similar injury in the region of the lower vagina resulting in urethrocele which may be further complicated by partial or complete loss of bladder control.

(3) Injury of the musculofascial structures chiefly in the lateral parametrium (cardinal ligaments) resulting in descensus of the corpus or prolapse.

(4) Injury to the posterior vaginal wall and its endopelvic fascial investment above the perineal body resulting in rectocele.

(5) Injury to the pelvic diaphragm resulting in lacerations of the perineum which may be of various degrees of severity and involve any combination or all of the structures which go to make up the supporting apparatus. This type of injury may, of course, extend into or through the sphincter ani.

(6) Injury to the structures which operate to hold the postvaginal wall and rectum in contiguity resulting in a descent of the culdesac of Douglas and enterocele.

To summarize the above, therefore, one may recognize as the cardinal lesions in birth injury: cystocele, urethrocele and incontinence, descensus of the corpus or prolapse, rectocele, laceration of the pelvic floor and enterocele. It may here be emphasized that each of these conditions is a separate entity which may exist quite alone but which is more often seen in combination with one or more of the others mentioned. The proper surgical correction of any individual case must logically be a correction of each or as many individual lesions as appear in it. Thus one finds a group of several patients with similar complaints who on superficial inspection would seem to present similar conditions and, therefore, require similar repair. Upon analysis one will be found to require work only upon the anterior wall; another will need correction of a descensus plus a repair of a rectocele and will be found to have no cystocele at all, while a third will present little else than an enormous rectocele. Each of these women will require a different type of operation when the sum total of work is considered, but the elements of repair done to each may be precisely the same in so far as it goes.

In the concluding paragraphs of this essay there will be presented somewhat in detail an operation for cystocele which, although not original with me, seems to me to possess the greatest advantages of any it has been my privilege to observe and which may serve as a guide in the performance of vaginal plastic work in general. In the meantime it is desirable to indicate the operations best suited to correct the several lesions enumerated above, bearing in mind that these recommendations are the result of personal conclusions from observation and experience and that they may be subject to change or complete reversal in the light of further knowledge.

I. Cystocele. The operation for cystocele consists in laying open the anterior vaginal wall in its midline from the cervix behind nearly to the urethral orifice in front, thereby exposing the descended bladder which may be likened to the contents of a hernia. The bladder is next separated from the cervix and restored to its proper level, after which the anterior wall, by the same analogy likened to the sac of the hernia, is in part excised, and its resulting cut edges approximated. One should always work with the entire thickness of the vaginal wall and its contiguous layer of the endopelvic fascia and never destroy its integrity nor be content with mucous membrane denudation and infolding of muscularis. The so-called fascia lapping principle of Bissell and Rawls may be employed in many cases with attenuated vaginal walls where, by lapping the flaps in double-breasted coat fashion, additional thickness and security can be obtained. The inter-

position of the uterus between the anterior vaginal wall and bladder presents no advantages in the correction of simple uncomplicated cystocele and is distinctly abnormal anatomically in the end.

II. Urethrocele and injury to the urethral sphincter resulting in incontinence of urine have no universally highly successful method for their correction, and a fair proportion of failures is encountered even by the most experienced operators. Probably the best plan is that originally advocated by Kelly in which the bladder muscle in the area of internal urethral sphincter is reduplicated with mattress sutures of linen or catgut. A snug replacement of the previously dissected anterior vaginal wall is also a valuable adjunct in securing additional strength.

III. Descensus of the corpus uteri may be encountered quite alone, although it is much more often found associated with varying degrees of cystocele; and correction of the latter, although strictly speaking not an operation for prolapse, is often an indispensable link in the chain of repair. Although the types of operation for prolapse are legion, it would appear to the author that but very few have in any sense a wide scope of application. It may be mentioned here that surgeons at the Woman's Hospital place little or no credence in the worth of round ligament suspension operations nor, indeed, of any intra-abdominal procedures, such as the various types of corpus fixation in the treatment of prolapse. Depending upon the age of the woman and the degree of the displacement it would appear that most cases could be handled with one of three methods: (1) the interposition operation; (2) the Alexandroff procedure; (3) vaginal hysterectomy. The interposition operation is ideal, in my opinion, when the relatively rare case to which it is applicable is met. The prerequisites are obviously a patient in whom pregnancy is impossible and a relatively mild degree of prolapse, with or without cystocele, in a uterus that is neither too large nor too small to fit snugly beneath the pubic rami. The Alexandroff procedure demands a wide separation of the entire thickness of the vaginal walls from the cervix laterally to the so-called fixed line of the vagina and an upward dislocation of the bladder which results in the exposure of the cardinal ligaments described above. These cardinal ligaments which are the lateral reduplications of the endopelvic fascia lying at the base of the broad ligaments and running from the upper cervix to the lateral pelvic walls are approximated in the midline in front of and to the cervix with interrupted catgut sutures as described in most standard textbooks on operative gynecology. The importance of this area of tenacious musculofascial tissue cannot be overemphasized in any operation for prolapse where the uterus is neither to be removed nor interposed, as it is almost the sole source of support of the corpus. Better than either the interposition or the Alexandroff is vaginal hysterectomy which, when carefully

done with a clear working knowledge of the anatomy, yields a high percentage of successful end-results. The actual removal of the uterus in itself is naturally one of the least important steps in the operation, as everything depends upon the subsequent disposal of the supporting structures which remain. From my own observation I am of the opinion that the best results will be obtained in the following manner: First and of inestimable importance is the method of approach which will be described under a technic for cystocele. The space between the vesicovaginal layer of the endopelvic fascia and the bladder is entered near the cervix and the entire vaginal wall with attached endopelvic fascia reflected laterally after median bisection. The bladder is dislocated upward, and after entering the peritoneum in the anterior culdesac the uterus is delivered into the operative field as in doing an interposition operation. The uterus may now be removed from either above or below, but I prefer the Mayo method as modified by Ward and well illustrated in the latter's contribution in Kelly's *Gynecology*. Here the uterus is removed with clamps, three on either side, from above downward, beginning at the free upper margin of the broad ligament close to the corpus and advancing to the cardinal ligament area. After removal of the corpus the free edges of the broad and cardinal ligaments are united in the midline, and the peritoneum is closed. Although these structures are utilized by many as additional bladder support, the danger of foreshortening the vagina by so doing must be reckoned with, and the question arises whether attaching them to the pubic arch is a necessary or desirable procedure. It would seem that a deeper vagina will be secured if these structures are allowed to retract into the culdesac, especially since the anterior vaginal wall with its contiguous fascial layer is strong enough alone to give adequate support to the bladder. Indeed this is all that one finds in this location under normal conditions. The operation is completed by a careful readjustment of the reflected anterior wall flaps as in the case of cystocele. A repair of the posterior wall and a perineoplasty is almost always a required adjunct to the hysterectomy and improves the appearance of the end-result, even though it does not actually contribute to the support of the structures concerned in prolapse.

IV and V. Of the six primary lesions enumerated above, the fourth and fifth, namely injury to the posterior vaginal wall and to the pelvic diaphragm, resulting respectively in rectocele and perineal laceration, are so frequently associated as best to be dealt with together, although either may occur entirely alone. Of the numerous procedures I have observed in my own and other hospitals I am most logically impressed by and I practice exclusively, the method recently described by Byron Goff, one which has been practiced by him and several members of the staff for a number of years. As in anterior wall work great stress is again placed

upon entrance into the proper lines of cleavage, so that the entire thickness of the vaginal wall may be advantageously used. The importance of entering and following the natural cleavage planes had been stressed by Bissell in 1918 when he wrote on a fascia-lapping operation for rectocele. It is to be noted that the operative procedure under consideration seeks three distinct though closely related ends, namely correction of rectocele, restoration of the levators and reconstruction of the perineum. The desired result is obtained by: (1) incision of the rectovaginal septum; (2) removal of the rectum from the herniated portion of the rectovaginal septum; (3) excision of the herniated portion of the septum; (4) closure of the hernial opening; (5) denudation of the perineum; (6) replacement of the levatores ani and reconstruction of the perineum. Perusal of Goff's paper which is exceptionally clearly illustrated will give one an excellent working idea of the method. In cases where the rectocele is disproportionately large the rectopexy of Ward may be used to advantage and the two procedures carried out in combination. It may be noted too that the method described is also admirably suited for the deeper lacerations with involvement of the anal sphincter simply by carrying the perineal denudation further downward and to the sides so as to reach the area of the retracted muscle ends. Our best results have been secured with silver wire.

VI. With the sixth and last lesion of the arbitrary group, viz., enterocele, I have had no personal experience, but because of the fairly high percentage of recurrences in the better clinics it would seem that the ideal operation is yet to be perfected.

The operation which I have selected to describe somewhat in detail is that for the correction of cystocele, which may, of course, be employed when this condition exists alone or as a part of more extensive work when there is coexisting prolapse, cervical disease, rectocele or laceration of the pelvic floor. The operation is a model of general procedure in other vaginal plastic work and is in most instances exceedingly simple to pursue, particularly if the initial steps are clearly understood by the operator and the desired line of cleavage is entered. Here it may again be stated as a cardinal principle that the entire thickness of the vaginal wall should always be left intact and so used in this work and that one should never be content, as pictured and vaguely described in many textbooks, to denude thin layers of mucous membrane and then to infold the remaining underlying structures of the vaginal wall with one or more tiers of sutures. By the latter method one cannot restore the bladder to its original level high on the cervix, nor can one correct the so-called weak spot which is the result of loss of contiguity between the lower cervix and anterior vaginal wall. In the actual performance of the operation the cervix is grasped with a volsellum and steadied under gentle traction by an assistant. Next a sound is inserted into the bladder, and the low point of descent of that organ is thereby determined and noted on the anterior wall near the cervix. Just below this point a scalpel is used to make a short superficial transverse incision on the anterior aspect of the cervix, involving if possible only the mucous membrane and amounting in length to about one-quarter of the circumference of the cervix at the level selected. Two Alis or sharp-nosed Kocher clamps are next

placed on either side of the superficial incision in the midline, and the anterior wall is elevated in a small tent. With sharp straight scissors the operator next makes a generous cut along the line of scalpel incision and enters the space between the endopelvic fascial investment of the vaginal wall and the underlying bladder and cervix. This transverse approach to the clear space between the vaginal wall and the bladder was first demonstrated to me by Bissell, and it cannot be too warmly advocated because of its simplicity and its comparative freedom from the liability of bladder injury. Once this approach is effected, the entire vaginal wall with its thin adherent endopelvic fascial layer is bisected in the midline by easy stages forward almost to the urethral orifice. The forward progress of this incision is alternated step by step with blunt separation of the underlying bladder from the vaginal wall in front and the cervix behind. The gauze-covered finger can accomplish this alone in practically every case where the proper line of cleavage is entered, although one must occasionally employ sharp dissection to separate the bladder from the lower cervix or to progress through dense scar tissue. This alternate blunt dissection and bisection of the anterior wall are continued until the bladder is restored to its proper level high on the anterior aspect of the cervix and the wall flaps are freed laterally to the so-called fixed points of the vagina on either side. A semi-oval, corresponding to the redundancy produced by the cystocele, is now excised from the vaginal wall on either side, and the resulting cut edges are approximated in the midline with interrupted catgut sutures. It is recommended that the lowermost three or four of these be so placed as to include the underlying cervix and thereby prevent descent of the bladder at the so-called "weak spot."

When the vaginal walls are thin and attenuated, or as a routine with some, a double barrier against descent of the bladder may be secured by overlapping the lateral flaps in double-breasted coat fashion. This procedure, with the same principles in view albeit different in technic, has been described independently by both Bissell and Rawls of our clinic and has been rather inaccurately referred to as the fascia lapping method of repair. It has much to commend it and gives an extremely good account of itself in the follow-up observations, but it is not an operation for the inexperienced or unskilled in plastic work, since it requires nicety of judgment and exactness of technic to make a first-rate adjustment of the flaps.

In conjunction with the operation just described mild or moderate grades of descensus with slack in the transverse cervical ligaments may be eliminated by the Alexandroff procedure of plication, or the anterior culdesac may be entered and the corpus delivered and interposed between the bladder and anterior vaginal wall. For the severer types of prolapse the transverse incision on the cervix anteriorly is continued to make a circumcision, and a vaginal hysterectomy is performed. The latter procedure is effected by clamp and ligature from below upward in the hands of some, but it would seem to me as noted before that the uterus best be removed by clamps from above downward, three on either side being the required number in most cases.

Although the work upon the anterior wall has been particularly emphasized, it may be noted again that the same principles apply in the correction of rectocele, since the posterior vaginal wall bears the same relation to the rectum as does the anterior wall to the bladder. At a point just above the perineal body the posterior vaginal wall may be elevated tent-like in precisely the same manner, and the clear

avascular space between vagina and rectum be entered by a generous transverse sweep of the scissors.

When the term vaginal wall is used in the foregoing remarks, the author wishes to stress the fact that what is meant is the vaginal wall in its entirety, including the contiguous layer of the endopelvic fascia which is intimately adherent to it. This fascia is by no means a true fascia, if by that term is meant a structure in any way comparable to the fascia lata of the thigh or to the fascia which one employs in inguinal hernia repair. On the other hand it is a relatively thin layer of loose mixed fibrous and elastic tissue containing a large plexus of blood vessels and is possessed of very little tensile strength. One should not, therefore, endeavor to separate it from the strong muscle coats of the vaginal tube but should allow the entire vaginal wall to remain intact except where mucosa is denuded for the purpose of lapping.

Written authority often speaks of and skilled operators frequently demonstrate a strong and relatively thick plane of tissue, lying apparently between the walls of the vagina and the bladder, to which the term fascia is applied. With regard to this tissue I am of the opinion that it is not fascia alone but simply an artificially split off layer of the strong muscular coat of the vagina to which the thin and relatively weak connective tissue layer described above is attached.

Reference to genital fistulas and to injuries of the cervix have purposely been omitted in this review, and in closing it may again be stated that the component parts of the various operations enumerated here are in no sense original with me. They are, however, the procedures I have selected from many in a large special clinic and which I regard as the most logical and satisfactory from the standpoint of anatomic reconstruction and from the even more important standpoint of end-results.

REFERENCES

- (1) *Bissell*: Tr. Am. Gynec. Soc. 43: 157, 1918. (2) *Bissell*: Surg. Gynec. Obst. 48: 549, 1929. (3) *Crossen*: Operative Gynecology, St. Louis, 1915, C. V. Mosby Co. (4) *Farrar*, in *Kelly*: Gynecology, New York, D. Appleton & Co., 1928, p. 288-304. (5) *Frank*: Surg. Gynec. Obst. 24: 42, 1917. (6) *Goff*: Surg. Gynec. Obst. 46: 855, 1928. (7) *Rawls*: Tr. Am. Gynec. Soc. 43: 133, 1918. (8) *Ward*, in *Kelly*: Gynecology, New York, D. Appleton & Co., 1928, p. 305-379.

37 EAST SIXTY-FOURTH STREET.

(For discussion, see page 692.)

THE END-RESULTS IN TEN CASES OF HYDATIDIFORM MOLE TREATED BY CURETTAGE*

BY MARGARET CASTEX STURGIS, M.D., F.A.C.S., PHILADELPHIA, PA.

(From the Gynecological Department of the Woman's Medical College of Pennsylvania)

MY PURPOSE is to present the history and the end-results in ten cases of hydatidiform mole treated by instrumental and digital curettage. Eight of these patients were under my personal care in private practice and on the gynecologic service of the Hospital of the Woman's Medical College of Pennsylvania. I am indebted to Dr. Catharine Macfarlane and Dr. Emily Augé, each for one case. These ten cases occurred in the last ten years and have been followed very carefully.

In view of the variety of opinions expressed by recent writers regarding the incidence and treatment of hydatidiform mole, I was prompted to review all the cases of abortion which have occurred on the gynecologic services of the Hospital of the Woman's Medical College of Pennsylvania for the last ten years and the Woman's Hospital of Philadelphia for the past eighteen years. From a total of 1318 abortions, there were found 15 cases with hydatidiform mole. Five of these are excluded from the main subject of the paper because three were treated by hysterectomy and two could not be followed up. The incidence of 15 cases of hydatidiform mole in 1318 abortion cases is interesting, being 1.1 per cent or more than one in 100 cases. Gordon in 1923 reported 21 cases found from a study of the gynecologic records at the Bellevue Hospital, New York City, for the preceding eleven years. Since there were admitted to the hospital approximately about 4500 cases of abortion during that time, he concluded that there was an incidence of about 4 cases in 1000 abortions or 0.4 per cent.

Earlier statistics are based on the number of hydatidiform moles found among pregnancies. Madame Boivin in 1827 found that hydatidiform mole occurred once in 20,000 pregnancies; Gebhardt observed 12 cases in 16,000 pregnancies; Williamson found one case in 2400 pregnancies. More recently Velasco, in 1922, reported an incidence of one hydatidiform mole in 204 maternity cases.

This very high incidence of hydatidiform mole which has come under my personal observation makes it seem to me of vital importance that the profession should appreciate the comparative frequency of hydatidiform mole. The actual frequency must be even greater. Very early moles, without doubt, escape detection by the gynecologist and

*Read at a meeting of the Philadelphia Obstetrical Society, October 3, 1929.

TABLE I

DATE, AGE, NATIONALITY, AND COLOR	MARRIAGE AND GRAVIDARUM	PREVIOUS PREGNANCIES	LAST PREGNANCY	BLEEDING BEGAN	DURATION	SIZE	BLOOD COUNT	WASSER-MANN	OPERATION	COMPLICATION	IMMEDIATE RESULT AND DAYS IN HOSPITAL	APPENDAGES	PATHOLOGIC REPORT	FOLLOW-UP
M. W. 9/20/18 30 American White	6 yr. 2 preg- nancies	1 child 3 yr. of age	6/?	7 wk. later	3 mo.	To umbi- licus	Not done	Neg.	9/20 Curet- tage	None	10 days in hospital. Discharged 9/30	No pal- pable en- large- ment	Not done	1 child 5 yr. Normal Menses reg- ular Patient well
A. S. 9/28/21 38 Austrian White	12 yr. None	None	6/?	Bleed- ing since Aug.	3½ mo.	1 finger below umbilicus	Hb. 55% R.B.C. 3,030,000 W.B.C. 24,000	Neg.	10/6 Curet- tage	Mild sapre- mia on admis- sion	19 days in hospital, 11 days in hos- pital after operation. Discharged 10/17	Left pal- pable mass size of tan- gerine	Hydatid- iform mole. No evidence of malignancy (Meine)	Patient well, men- ses regular. 1 child born June, 1923. 1 child born April, 1927.
M. H. 9/18/22 39 Irish- American White	19 yr. 3 preg- nancies	1st—16 yr. Liv- ing and well. 2nd—3 mo. mis- carriage 2½ yr. ago. 3rd— this one	6/13	8/1	3 mo.	4 fingers above sym- physis	Hb. 70% R.B.C. 3,184,000 W.B.C. 8,800	Neg.	9/20 Curet- tage	Hemor- rhage sepsis	Died 9/27/22	Not pal- pated	Hydatid- iform mole. No evidence of malignancy (Meine)	Died 9/27/22
J. R. 1/28/23 25 American White	7 yr. 5 preg- nancies	3 living children. Miscar- riage 1922. Normal deliveries	8/7	11/4	5 mo.	4 fingers above sym- physis	Hb. 75% R.B.C. 4,290,000 W.B.C. 8,050	Neg.	1/31 Curet- tage	None	13 days in hospital, 10 days in hos- pital after operation. Discharged 2/10	Not pal- pated	Hydatid- iform mole. No evidence of malignancy (Meine). 1 liter of typically bloody mole	Died Oct., 1923. Rush Hospital Acute Pul- monary T. B. Tubercle bacilli dem- onstrated in sputum. Ex- isted prior to mole.

TABLE I—CONT'D

DATE, AGE, NATIONAL- ITY, AND COLOR	MAR- RIAGE AND GRAV- IDARUM	PREVIOUS PREG- NANCIES	LAST PREG- NANCY	BLEED- ING BEGAN	DUR- ATION	SIZE	BLOOD COUNT	WASS- ER- MANN	OPERA- TION	COMPLI- CATION	IMMEDIATE RESULT AND DAYS IN HOSPITAL	APPEND- AGES	PATHOLOGIC REPORT	FOLLOW-UP
E. L. 9/28/23 22 Russian White	8 mo. None	None	6/22	7/22	3 mo.	To umbi- licus	Hb. 40%	Neg.	10/8 Curet- tage	Mild supre- mia on admis- sion	26 days in hospital, 14 days in hos- pital after operation. Discharged 10/22	Not pal- pated	Hydatid- iform mole. No evidence of malignancy (Abbott)	Living in N. Y. Is well and has had 2 pregnancies since. Normal de- liveries. Normal children.
D. B. 10/7/23 22 Italian White	16 mo. None	2 preg- nancies 1 deliv- ery at 8 mo. lived 11 days "Would not nurse" Spon- taneous labor	7/19	9/15	3 mo.	4 fingers above sym- physis	Hb. 65% R.B.C. 3,860,000 W.B.C. 12,800	Neg.	10/8 Curet- tage	None	10 days in hospital. Discharged 10/17	Tender elastic mass in left side	Hydatid- iform mole. In sev. places cells with multi- ple large, deeply stained nuclei sug- gesting ma- lignancy (Abbott)	Baby born April, 1925. Mis- carriage. July, 1928 3 mo. Also Oct., 1927, 3 mo. Had curet- tage. Noth- ing abnor- mal reported
R. C. 5/10/25 29 American White	3 yr. None	None	1/20	4/10	4 mo.	To umbi- licus	Hb. 40% R.B.C. 2,160,000 W.B.C. 12,000	Neg.	5/14 Curet- tage	Hemor- rhage Grave supre- mia and acidosis on ad- mission	25 days in hospital. Discharged 6/8	No pal- pable en- large- ment	Not done	1 child 11 mo. Normal delivery Normal child Patient well, menses reg- ular prior and since this delivery

TABLE I—CONT'D

DATE, AGE, NATIONAL- ITY, AND COLOR	MAR- RIAGE AND GRAV- IDARUM	PREVIOUS PREG- NANCIES	LAST PREG- NANCY	BLEED- ING BEGAN	DUR- ATION	SIZE	BLOOD COUNT	WASS- ER- MANN	OPERA- TION	COMPLI- CATION	IMMEDIATE RESULT AND DAYS IN HOSPITAL	APPEND- AGES	PATHOLOGIC REPORT	FOLLOW-UP
C. D. 6/3/27 29 American White	10 yr. 4 preg- nancies	7 yr., 5 yr., 3 yr., and well No mis- carriages Normal	3/21	5/21 Nau- sea and vomit- ing for 3 wks.	2½ mo.	1 finger below umbi- licus	Hb. 68% R.B.C. 4,160,000 W.B.C. 6,800	Neg.	6/8 Curet- tage	Sapre- mia	15 days in hospital, 9 days in hos- pital after operation. Discharged 6/17	No pal- pable en- large- ment	Hydatid- iform mole (Meine)	Patient well No child since
M. B. 9/14/27 38 White	16 yr. 8 preg- nancies	16, 13, 11, 10, 5, 1½ All liv- ing and well 4 yr. ago had mis- carriage Others normal	6/30	9/4	2½ mo.	2 fingers below umbi- licus	Hb. 50% R.B.C. 2,670,000 W.B.C. 12,000	Neg.	9/14 Curet- tage	Hemor- rhage	9 days in hospital. Discharged 9/23	Not pal- pated	Hydatid- iform mole. No evidence of malig- nancy (Ingleby)	Patient well, menses reg- ular, no pregnancy. Last few months had menses every 3 weeks. No clotting.
E. J. 11/14/28 44 Colored	27 yr. 7 preg- nancies	25, 11, 9, 7½, 6 All liv- ing and well Early miscar- riage 23 yr. ago	9/9	10/7 Had breast re- moved 24 yr. ago	2 mo.	To umbi- licus	Hb. 60% R.B.C. 3,450,000 W.B.C. 10,500	Neg.	11/15 Curet- tage	None	9 days in hospital, 8 days in hos- pital after operation. Discharged 11/23	Round mass in left side about 4 in. in diameter	Hydatid- iform mole. No evidence of malig- nancy (Ingleby)	Patient well. Menses reg- ular. Mass subsided.

again by the pathologist. The search of recent literature reveals much concerning the unusual cases and the unusual treatment, but scarcely nothing on the simple statistical recording of the cases observed with the end-results of the treatment applied. Hence, this paper is to place on record the end-results of ten cases treated by simple curettage.

The age in this series ranged from twenty-two to forty-four years. Five cases were in the twenties, four in the thirties, and one at forty-four. All were white except one colored patient. Seven were American born; one was an Italian, and one an Austrian. These observations as to age, race, and color are not unusual. The mole was the first pregnancy in three cases, the second pregnancy in two, and the third in one case. One case was gravida iv; one gravida v; one gravida vii; and one gravida viii. Seven out of ten cases occurred in multigravidae.

Before considering the treatment, one must discuss the mortality attendant on placental degeneration from hydatidiform mole. Embryonic death rate invariably is about 100 per cent, so maternal mortality is the one consideration. The causes of death are generally given as hemorrhage, sepsis, perforation of the uterus followed by peritonitis, and chorionepithelioma.

Maternal death rate therefore has been variously estimated at from 10 per cent to 25 per cent. Findley, in his analysis, gives the death rate due to hemorrhage at 4 per cent; perforation of the uterus with peritonitis and general infections, 2 per cent; and chorionepithelioma, 16 per cent. The total mortality he estimates at 22.5 per cent. Williams gives 10 per cent to 26 per cent and Hirst 18 per cent to 25 per cent. Gordon had 9 per cent mortality in the Bellevue series. The one death in our series resulted from infection superimposed on a severe anemic state.

There exists a great variety of opinions as to the frequency with which chorionepithelioma follows hydatidiform moles. Gordon would reduce the percentage to a minimum, probably to less than one per cent. He bases this opinion on the experience of Dr. Doyle Symmers, director of the Bellevue Laboratories, whom he states did 8,000 autopsies at Bellevue Hospital in eleven years previous to his article in 1923 and examined more than 35,000 vaginal specimens and found but one chorionepithelioma.

The literature is full, however, of reported cases of chorionepithelioma. Bland writes in 1928 that there has been a total of 612 cases reported in the literature. How many of these cases followed hydatidiform moles is not stated. Teacher found 73 of his 188 cases of chorionepithelioma followed hydatidiform mole, 36.6 per cent. Polossin and Violet found 203 cases of their 455 to follow hydatidiform moles, 45 per cent; and Hirschmann and Cristofolletti found 48 per cent of their series followed hydatidiform moles. DeLee says that "notwith-

standing the textbook statement to the contrary, we have never seen in thirty-five years of special practice a chorionepithelioma follow upon a hydatid, though chorionepithelioma has been frequently observed following other conditions of the pregnant state."

In view of the danger associated with hydatidiform mole, as to the primary mortality as well as secondary malignancy, Schumann has advised opening the uterus by abdominal hysterotomy and removing the uterus, or sewing it up, if complete removal of its contents was possible. He relies upon whether or not the growth is confined to the endometrium on macroscopic examination; the presence of blood spaces indicating muscular invasion.

Williams considers this recommendation unduly radical and says that he feels sure that it will lead to the unnecessary sacrifice of many uteri. At the same time he does not disapprove of routine hysterectomy for this condition should it occur at the end of sexual activity. Bland likewise does not commit himself to so radical a procedure but rather advocates a careful curettement of the uterine cavity and relies upon the pathologic report as to the findings to determine further surgical treatment. "Any abnormal activity in the Langhans's cells should constitute the guide for further treatment" is his opinion. Cullen says that a "diagnosis of early chorionepithelioma cannot be made on curettings; a section of uterine muscle being absolutely necessary for diagnosis."

The treatment applied to all ten cases reported in this paper was a careful curettement, being assured, if possible, by a final digital examination that the uterus was clean at the end of operation.

A personal follow-up has been done with each case with the following summary of end-results. One immediate death from sepsis. One died nine months later in the Rush Hospital from pulmonary tuberculosis. A study of the records showed that tubercle bacilli were demonstrated in the sputum and that the disease existed prior to the hydatidiform mole. Five have been well over five years and have each had one or more normal pregnancies since the operation. Two have been well over one year. The last one was operated upon six months ago and is now well. No pregnancies have occurred in the last three more recent cases.

The only case reported suspiciously malignant after careful microscopic examination of the uterine contents refused to have further operative treatment. Since that time she has had a normal child born two years thereafter, April, 1925; and two miscarriages, one in October, 1927, and another in July, 1928, each of three months' duration.

My conclusions following this study are:

1. Hydatidiform mole occurs much more frequently than recorded.
2. Infection and hemorrhage are the most serious complications.

3. Delay in recognition and, therefore, delay in treatment increases the danger of primary mortality and adds considerably to morbidity from hydatidiform mole. All ten cases in this series presented some degree of sapremia on admission to the hospital and the one fatal case had sepsis.

4. Chorionepithelioma is a comparatively rare sequence.

5. A careful curettage in experienced hands is as safe as well as a conservative method of treatment for hydatidiform mole, especially in the young woman who still desires a family. Five out of this series of ten have had one or more normal pregnancies since the curettage. Three others are well and still retain their childbearing functions.

1930 CHESTNUT STREET.

(For discussion, see page 695.)

A TEST OF LABOR*

BY JOHN M. LAFERTY, M.D., PHILADELPHIA, PA.

(From the Obstetric Department, St. Mary's Hospital)

THE term "a test of labor" is ordinarily used to denote an indefinite period of expulsive pains which a pregnant woman at term is permitted to undergo in order to determine her ability to deliver her baby spontaneously.

There are no generally accepted rules for conducting such a test, the judgment of the attendant being the only guide.

A test of labor to be of value must indicate the time during the course of labor, when interference is necessary to save the mother or fetus from injury.

The rules for conducting a test of labor devised by Tweedy while master of the Rotunda in Dublin have been used in Dr. Lawrance's clinic at St. Mary's Hospital for fourteen years and have proved reliable in indicating correctly the time when interference was necessary.

Tweedy's rules are: First, determination of maternal pulse and temperature every two hours, or more often. Second, a count of the fetal heart sounds every two hours, or more often. Third, when the pulse and the temperature of the mother rise above 100° F., interference is indicated in behalf of the mother. Fourth, when the fetal heart sounds rise above 160 or fall below 120 on three consecutive counts at one minute intervals, interference is indicated in behalf of the baby.

These rules are easily carried out especially in a hospital where the nurses can very readily be trained to count the fetal heart sounds as well as to take the pulse and temperature. In the home either the nurse or even any ordinarily intelligent lay person can very quickly

*Read at a meeting of the Philadelphia Obstetrical Society, October 3, 1929.

TABLE I. THE PRIMARY AND SECONDARY COMPLICATIONS IN 822 LABORS

COMPLICATIONS OF LABOR IN 822 CASES GIVEN THE TWEEDEY TEST	CASES WITH PRIMARY COMPLICATIONS		CASES WITH SEC. COMPLICATIONS		RESULTS				GUIDED BY PRIMARY STATES, OPERATION WOULD HAVE BEEN ATTEMPTED IN	GUIDED BY THE TEST THERE WERE				TOTAL FAILURES AND PERCENTAGE FOR EACH COMPLICATION				
	MATER- NAL	DEVELOPING DURING LABOR	PETER. MORBID	MOTHERS		BABIES		SPONTANEOUS DELIVERIES		OPERATIVE DELIVERIES		TEST GUIDED CORRECTLY	TEST FAILED TO GUIDE	TOTAL CASES	TEST GUIDED CORRECTLY	TEST FAILED TO GUIDE		
								TEST GUIDED CORRECTLY		TEST FAILED TO GUIDE	TOTAL CASES						TEST GUIDED CORRECTLY	TEST FAILED TO GUIDE
Contracted pelvis, 2nd and 3rd degrees ¹	134	86	22	21	1	126	8	95 70%	78	75	3	56 41%	52	4	7 5%			
Cardiac complications ²	13	9	0	0	0	13	0	13 100%	8	3	5	5 38%	5	0	5 38%			
Primary inertia	25	12	4	2	0	24	1	0	6	4	2	19 76%	18	1	3 12%			
Placental abnormalities	10	2	1	0	0	9	1	10 100%	8	7	1	2 20%	2	0	1 10%			
Oligohydramnios	10	2	0	0	0	10	0	0	9	9	0	1 10%	1	0	0			
Totals	192	111	27	23	1	182	10	118 61%	109	98	11	83 43%	78	5	16 8%			

¹Determined by pelvimetry and labor.²Threatened rupture of compensation.

TABLE I—CONT'D
Cases developing secondary complications whose primary status did not show any ascertainable defect and hence not included above.

Postpartum hemorrhage	0	13	0	4	0	13	0	0	0	12	0	12	1	0	1	13
Maternal distress	0	4	0	0	0	3	1	0	0	0	0	0	8%	4	0	100%
Secondary inertia	0	11	0	1	0	11	0	0	0	1	1	0	100%	10	1	1
Fetal distress	0	0	11	0	0	11	0	0	0	0	0	0	91%	11	1	9%
Totals	0	28	11	5	0	38	1	0	0	13	1	12	26	23	3	38%

COMMENT

Number of cases with primary complications 192
Number of cases with secondary complications alone 39

Total number of serious complications in 822 labors 231

Maternal mortality in these 231 labors was 0.43 per cent (cause of death was hepatitis following a cesarean section).
Maternal mortality in these 231 labors was 0.43 per cent (cause of the death was hepatitis following a cesarean section).

Fetal mortality, including stillborn, was 5 per cent.
In gross the test failed to reveal maternal or fetal distress in time or at all in 31 of the 231 labors or 13 per cent.

Thirteen of these failures were cases of postpartum hemorrhage all of which had had an anesthetic and hence might logically be excluded.
Five of the cardiac cases were considered failures because the heart muscle showed added damage after labor.

be shown how to count the pulse and fetal heart sounds and to take the temperature. There should be, however, a check-up of the accuracy of the count at intervals by the attending physician.

The only contraindication for applying the test is an elevation of the mother's pulse and temperature or fetal distress due to factors other than labor. The test is indicated in all labors except the relatively infrequent ones when the best obstetric judgment indicates that no labor should be permitted.

The advantages of the Tweedy test of labor are: First, it is scientific, being based on observed physical findings and not on individual judgments which are apt to be influenced by many extraneous factors.

TABLE II. TOTAL OPERATIVE INCIDENCE IN 822 LABORS GUIDED BY THE TWEEDY TEST

	GUIDED BY TEST									TOTAL OPERATIONS BY PRIMARY STATUS	TEST GUIDED	
	TOTAL OPERATIONS	INSTRUCTION OPERATIONS	C. P. AND ABNORMAL PRESENTATIONS	PRIMARY INERTIA	CARDIAC AND CARDIORENAL	PLACENTA PREVIA	SECONDARY INERTIA	MATERNAL DISTRESS	FETAL DISTRESS		CORRECTLY	FAILED
Operation probable by primary status			95	0	13	10	0	0	0	118		
										By test		
Forceps, low	54	6	25	3	5	0	9	3	3	48	46	2
Forceps, mid	30	3	15	7	1	0	0	1	3	27	23	4
Forceps, high	1	0	1	0	0	0	0	0	0	1	1	0
Cesarean section	11	0	9	0	0	2	0	0	0	11	11	0
Breech extraction	8	0	3	1	0	0	0	0	4	8	7	1
Version	17	0	6	7	1	0	2	0	1	17	15	2
Totals	121	9	59	18	7	2	11	4	11	112	103	9
Test guided correctly			53	17	7	2	10	4	10	103	103	
Test failed to guide			6	1	0	0	1	0	1	9		9
Totals			59	18	7	2	11	4	11	112	103	9

COMMENT

Total operative incidence in 822 labors guided by the test, 14 $\frac{7}{10}$ per cent.

Operations for instruction (forceps) 1 per cent.

Forceps were used in 10 per cent of the 822 labors. (Only one high forceps.)

Versions 2 per cent " " " "

Cesarean sections 1 per cent " " " "

Breech extractions 1 per cent " " " "

The test guided correctly in 92 per cent of the 112 operative deliveries guided by the test.

In 118 of the 822 cases there was a primary status justifying operation or 14 per cent.

The actual operative rate under the test in this group was 8 per cent, a decrease of 6 per cent.

In 704 deliveries there was no primary status to indicate the need for operation but operation was found necessary in 44 cases or 6 per cent.

Second, it is easily carried out; nurses with few exceptions, being readily trained to obtain the necessary data accurately, and on several occasions lay persons have been able to count the pulse and fetal heart sounds and to take the temperature satisfactorily. Third, if the general practitioners were taught to use this guide and to rely on it, much unwarranted and pernicious interference with labor would be avoided and it would add greatly to their confidence in managing long tedious labors. Fourth, if the patient and relatives can be assured that the attendant has definite and accurate means of determining when interference is demanded, it relieves them of worry and uncertainty and spares the doctor a not infrequent cause of great annoyance. Fifth, the general adoption of such a standard test would enable us to compare more accurately the indications for the various obstetric operations.

The compilation of statistics to show the value of the Tweedy test of labor presents many difficulties, and so many factors have to be considered, that only a study of individual case reports could give a correct estimate of its true worth. There are, however, several ways by which its usefulness may be shown relatively. The first is by a consideration of the results obtained in the management of the complications of labor. (Table I.)

The complications of labor in this study are considered as primary when they are recognizable before or shortly after the onset of labor and secondary when they result from the labor and occur only as labor progresses. In some cases the secondary complications develop

TABLE III. MATERNAL MORBIDITY AND MORTALITY IN 822 LABORS GIVEN THE TWEEDY TEST

	PERIOD OF ORIGIN AS REGARDS LABOR						OPERATIVE DELIVERIES		TOTALS	
	BEFORE		IN		AFTER		L	D	L	D
	L	D	L	D	L	D				
Puerperal infections:										
(A) Septicemia										
(B) Parametritis										
(C) Peritonitis	4	1	5	1	0	0	3	1	9	2
(D) Thrombophlebitis, etc.										
Sapremia	0	0	33	0	0	0	16	0	33	0
Pulmonary	3	0	0	0	0	0	2	0	3	0
Neurasthenia	2	0	0	0	1	0	0	0	3	0
Mammary	0	0	0	0	2	0	0	0	2	0
Intestinal	2	0	0	0	0	0	0	0	2	0
Cardiac	2	0	0	0	0	0	1	0	2	0
Miscellaneous	5	0	0	0	1	1	2	0	6	1
Total morbidity	18	1	38	1	4	1	24	1	60	3

COMMENT

Total maternal morbidity (dead plus sick) 7.6 per cent old Rotunda Standard.

Maternal mortality was 0.0364 per cent, i.e., 3.6 deaths per 1000.

39 per cent of the morbid cases were operative deliveries.

33 $\frac{1}{3}$ per cent of the deaths were operative deliveries.

In 19 of the 63 morbid cases the morbidity originated before the onset of labor.

as a result of the primary while in other cases either because of faulty examination or subtle masking no primary condition to account for the secondary complication is found. Hence in the table we have divided the complications into first, primary and their developing secondary complications, and second, the secondary alone.

Where there are primary complications there is frequently a primary status indicating operative interference. Therefore, we have also considered the cases from the standpoint of those having a primary operative status, and those having no primary operative status.

TABLE IV. FETAL AND INFANTILE MORBIDITY AND MORTALITY IN 822 LABORS GUIDED BY THE TWEEDY TEST OF LABOR

PRIMARY CAUSES	ORIGIN OF MORBIDITY IN RELATION TO LABOR OR TIME OF ADMISSION						TOTAL		RESULTS IN 822 LABORS	
	BEFORE		UNKNOWN		AFTER OR DURING		L	D	PER CENT MORBID	PER CENT DIED
	L	D	L	D	L	D				
Unknown	0	5	0	1	0	4	0	10	1.0	1.0
Weight under 5 pounds or pre- maturity	0	0	0	0	0	7	0	7	0.8	0.8
Congenital defects	8	0	0	0	0	5	8	5	1.5	0.6
Intracranial hem- orrhage	1	1	3	0	12	9	16	10	3.0	1.0
Acute enteritis	0	0	0	0	0	1	0	1	0.1	0.1
Compression or hemorrhage of fundus	3	2	0	0	0	3	3	5	0.8	0.6
SECONDARY CAUSES										
Unknown	0	1	0	0	0	6	0	7		
Contracted pelvis	0	0	0	0	0	7	0	7		
Abnormal presen- tations	0	1	0	1	0	4	0	6		
Prolonged and pre- cipitate labors	0	0	0	0	0	2	0	2		
Placental abnor- malities	0	5	0	0	0	5	0	10		
Maternal toxemia	0	1	0	0	0	3	0	4		
Malena	0	0	0	0	0	2	0	2		
AGENTS										
Operations ill- chosen	0	3	0	1			0	4		
Operations, wise	0	0	0	0	0	9	0	9		
Trauma, external	0	1	0	0	0	0	0	1		
MORBID INFANTS										
Died neonatal		0		0		23		23		
Died intrauterine		8		1		6		15		
Lived	12		1		14		27			
Totals	12	8	1	1	14	29	27	38		

COMMENT

Total fetal morbidity (dead plus sick) 7.8 per cent.

Fetal mortality including stillborn, 4.6 per cent.

In 20 of the 65 morbid cases the morbidity originated before labor.

Eight of the babies died before the onset of labor.

The complications considered in Table I were all serious ones, the minor degrees of each complication being excluded.

The second way by which the value of the Tweedy test may be shown is by a study of the total operative incidence (Table II).

Tables III and IV show the maternal and fetal morbidity and mortality in the labors guided by this test.

The material used in compiling these tables is from the clinic of Dr. J. S. Lawrance at St. Mary's Hospital for the years 1922 to 1927 inclusive, a total of 822 cases, all of which were given the Tweedy test of labor.

CONCLUSIONS

1. The Tweedy test of labor has proved its value in fourteen years of careful clinical trial at St. Mary's Hospital of Philadelphia and has rarely failed to indicate distress of mother or fetus in time for proper interference to be carried out. It has frequently saved women from dangerous operative deliveries. A number of times it has indicated the need for interference when no such need was suspected.

2. It has shown very definite results in the management of the complications of labor. It failed to warn in time or at all in only 13 per cent of 231 serious complications of labor.

3. It had a very definite effect on the operative rate, positively by indicating the need for operation in 6 per cent of the cases where the primary status did not reveal any need and negatively by decreasing the operative rate 6 per cent in cases where the primary status would have justified operation.

4. It has been a factor of considerable importance in the production of a low maternal and fetal morbidity and mortality rate.

5. The confidence which the Tweedy test gives one in managing a labor, especially a long tedious case, cannot be shown statistically, but it is a very important benefit to the physician.

CARCINOMA OF THE CERVIX COMPLICATING PREGNANCY. X-RAY THERAPY WITH THE BIRTH OF A NORMAL CHILD*

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CARCINOMA of the cervix complicating pregnancy while not rare is of infrequent occurrence in obstetric practice. Carcinoma of the cervix in women of the Jewish race is very unusual; associated with complicating pregnancy, it is extremely rare. Katz of Vienna reports carcinoma of the cervix occurring in but 25 out of 82,825 total obstetric cases handled in his clinic.

During the past four years, of 119 cases of carcinoma of the cervix treated at Bellevue Hospital by radiation therapy there were but seven cases in women who were Jewesses. Vineberg reports nine such cases in 2,000 seen at Mount Sinai Hospital, in thirteen years.

Where pregnancy and malignancy coexist, the question arises whether to interrupt the pregnancy at once or allow it to proceed and then treat the local lesion. Toombs says that coexisting malignancy and pregnancy demands treatment of the former regardless of the fetus. As embryonic tissue is most sensitive to radiation, Nurenberg states that radiation during pregnancy is dangerous to the fetus, and this assumption is borne out by the observations of Regaud, Ewing, Russ and others. If we regard the fetus as the essence of embryonic tissue, then it as a whole should be most sensitive to radiation. Experimental results on animals are reported by Bagge, Penzoldt, Martius, Driessen and others to bear out this theory, although Robinson and Levine have shown some contrary results.

The x-rays, while in their action on isolated tissues are physically equal to the action of radium, do not seem to exert such a deleterious effect on the fetus when applied to the uterus externally through the body. In nearly all the cases where destruction of the fetus had occurred, radiation has been effected by direct contact with the radioactive energy source. Kane, however, reports a normal child born of a mother treated with radium without the presence of the pregnancy having been noted at the time of treatment.

Wyser and Mayer have successfully aborted numerous women with x-rays, and Zimmerman says that the usual dosage as given in the x-ray treatment of malignancy

*From the Department of Obstetrics, Dr. Hervey Williamson, Director, the Department of Gynecology, Dr. Frederick C. Holden, Director, and the Radiation Therapy, Dr. Ira I. Kaplan, Director.

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nancy produces spontaneous abortions. Parkes claims that the termination of pregnancy is the most striking result of irradiation at that period.

Murphy in his review of the literature shows statistically the results of isolated cases of abnormal children born of irradiated mothers and, therefore, holds irradiation at fault; but abnormal children have been born of mothers never irradiated. Williamson, Döderlein, Rubin, Rongy, myself and others have reported healthy normal children born of mothers treated with x-rays for various gynecologic conditions.

In no instance among the vast number of cases radiographed for definite diagnosis at Bellevue Hospital has abortion occurred, or has an abnormal child been born of such an irradiated mother. Yet during this same period there were abnormal children born of mothers who had never been x-rayed. Murphy states that radiation in cases where future pregnancy is expected is contraindicated, but contrary to his conclusions normal offspring following irradiation of the mother have been reported by Rubin, Rongy, Smith, Bolaffio and myself.

Recently I reported the normal birth of a perfectly formed child of a tuberculous mother previously treated by x-rays for the interruption of a previous pregnancy, and for the suppression of the menses. Penzoldt states that normal offspring can be born of irradiated mothers provided the pregnancy occurs four months or later after radiation has been given.

The case herewith reported is one in which a malignancy of the cervix coexisted with pregnancy, and in which partial x-ray therapy was given with the idea of producing an abortion so that the local lesion could be better cared for by local irradiation.

Report of Case.—F. G., Jewish, age thirty-three years, married, born in Austria. Has had six previous pregnancies, five children, four living and one dead and one miscarriage. Admitted on the obstetric service of Bellevue Hospital, in November, 1928, with the complaint of persistent bleeding for three months beginning in July. She was not certain that she had been pregnant and miscarried in spite of the bleeding. The woman was very obese and abdominal examination was difficult. Vaginal examination showed a markedly irregular ulcerated cervix, bleeding easily on manipulation, and an early associated pregnancy was thought to be present, although on account of the obesity, a definite mass could not be felt. She was referred to the gynecologic service for opinion as to the presence of malignancy in the cervix, and then to the radiation therapy department with a positive clinical diagnosis of epithelioma. Examination and biopsy of the lesion showed the presence of a definite plexiform epithelioma.

In consultation with the gynecologist, we advised interruption of the pregnancy and subsequent irradiation for the malignancy. The patient refused operative interference and external x-ray therapy was commenced. The patient received but three doses of high voltage x-rays, 50 per cent of a skin erythema dose on the anterior and 25 per cent dose on the posterior pelvis and then disappeared. Frequent letters to her procured no response. On March 15, 1929, she returned to the obstetric clinic at Bellevue Hospital. Examination revealed a pregnancy of eight to nine months with a markedly ulcerated irregular granular cervix, bleeding on manipulation. The fetus in utero was alive in normal position and condition. The patient was advised to enter the hospital and have an operative delivery of the child

performed, she refused this advice. Nothing further was heard or seen of the patient until delivery May 2, 1929, at another maternity hospital where she had applied for assistance.

Unfortunately at this latter hospital the full significance of the condition of the cervix was not realized until the patient was in labor. An attempt at delivery through the cervical birth canal was made with the aid of dilatory bags. The patient had a prolonged and difficult labor during which the fetal cord prolapsed, and the child which was alive till then was suffocated in the delivery. The placenta was easily delivered; later there occurred severe hemorrhages from the severely lacerated cervix, which was with difficulty controlled by vaginal packing. On account of the loss of blood and the poor general condition of the patient, transfusions were given on the ninth and tenth days of May.

The baby weighed eight and one-half pounds, and was absolutely normal in form and size.

The patient was referred back to Bellevue Hospital twelve days postpartum; her condition was poor. Temperature 100.4° , pulse 100. Examination vaginally showed a markedly purulent discharge. There was moderate bleeding from the torn cervix, which was soft, spongy and granular. The tears extended to the lateral vaginal and the rectovaginal walls posteriorly. On account of the bleeding and the infection present it was deemed advisable to treat the malignant cervix only by a local radium applicator. This treatment was given by means of a modified "Colpostat" containing 45 milligrams of radium, placed up against the lacerated cervix. The vagina was packed and drained with iodoform gauze. A dose of 4300 milligram hours of radium over a period of four days was administered. There was only a slight reaction in the way of temperature; the patient bore the treatment very well. When the radium was removed, no bleeding occurred from the cervix. Two days later a radium sound containing 30 milligrams of radium was inserted into the uterus, and 2880 milligram hours of radium treatment were given over a period of two days. The patient reacted well, having slight distress and no rise in temperature.

Three days following the radiation treatment, the patient began to bleed per vagina, which in spite of packing persisted throughout the night. Transfusion was given and a dose of high voltage x-rays to the spleen. The packing meanwhile had begun to control the bleeding. During the following four weeks the patient had recurring hemorrhages whenever the packing was removed, which necessitated frequent transfusions being given.

At present (November, 1929) the patient is in good condition, carrying on her household duties and has gained thirty pounds in weight. The local condition of the cervix is completely healed.

CONCLUSIONS

Coexisting malignancy and pregnancy is an unfavorable condition and requires immediate termination of the pregnancy, followed by radiation treatment.

Radiation given knowingly or unknowingly during pregnancy is not always followed by abortion.

Radiation so given usually is fatal to the fetus in utero, but normal children may be born following partial radiation through the mother.

Abnormalities in children born of irradiated mothers may be due to other sources than the irradiation.

Delivery of the fetus in carcinoma of the cervix should be by operation; delivery via the cervix is contraindicated.

REFERENCES

- (1) *Bagg, H.*: Am. J. Roentgenol. **16**: 529, 1926. (2) *Bolaffio, M.*: Strahlentherapie **23**: 288, 1926. (3) *Döderlein, A.*: Deutsche Med. Wehnschr. **54**: 1997, 1928. (4) *Driessens, L. F.*: Strahlentherapie **16**: 656, 1924. (5) *Ewing, J.*: Am. J. Roentgenol. **21**: 313, 1929. (6) *Farrar, L. K. P.*: Surg. Gynee. Obst. **43**: 719, 1926. (7) *Kane, H. F.*: Virginia M. Monthly **55**: 308, 1928. (8) *Kaplan, Ira I.*: AM. J. OBST. & GYNEC. **14**: 40, 1927. (9) *Kaplan, Ira I.*: Surg. Gynee. Obst. **50**: 1930, 1929. (10) *Katz, H.*: Wien. klin. Wehnschr. **40**: 1, 1927. (11) *Martius, H.*: Strahlentherapie **24**: 101, 1927. (12) *Mundell, J. J.*: AM. J. OBST. & GYNEC. **13**: 86, 1927. (13) *Murphy, D. P.*: Surg. Gynee. Obst. **48**: 766, 1929. (14) *Nuremberg, L.*: Strahlentherapie **24**: 125, 1927. (15) *Parkes, A. S.*: Proc. Roy. Soc. Edinburgh **102**: 51, 1927. (16) *Penzoldt, R.*: Strahlentherapie **21**: 625, 1926. (17) *Regaud, C.*: Biological Principles of Radiotherapy of Malignant Diseases. Lecture in New York, June 19, 1924. (18) *Robinson, M. R.*: Am. J. Roentgenol. **18**: 1, 1927. (19) *Rongy, A. J.*: AM. J. OBST. & GYNEC. **7**: 169, 1924. (20) *Rubin, I. C.*: AM. J. OBST. & GYNEC. **12**: 76, 1926. (21) *Russ, S., and Colwell, H. A.*: Radium X-Rays and Living Cells, London, 1924, G. Bell & Sons. (22) *Schmitt, H.*: Strahlentherapie **30**: 24, 1928. (23) *Toombs, P. W.*: AM. J. OBST. & GYNEC. **17**: 516, 1929. (24) *Vineberg, H.*: Contributions to Medical & Biological Research Dedicated to Sir William Osler, July 12, 1919. (25) *Williamson, H.*: Personal Communication to Author. (26) *Wyser, D. D., and Mayer, M. D.*: AM. J. OBST. & GYNEC. **14**: 62, 1927. (27) *Zimmerman, R.*: Strahlentherapie **29**: 108, 1928.

55 EAST 86TH STREET.

ERGOTISMUS GANGRENOSUS*

BY PHILIP OGINZ, M.D., F.A.C.S., BROOKLYN, N. Y.

THE use of ergot in any form, both in hospital service and private practice, generally is not associated with untoward reactions. Rarely if ever does the physician give the matter of its toxicity any consideration as he does in the use of other drugs, such as quinine or the salicylate group, for cases of ergot poisoning with serious consequences seldom occur. Obstetricians of great experience almost never meet during a lifetime of service, with a single case of ergot poisoning, and yet a review of the literature reveals that such cases do occur, and more frequently than is generally supposed. It is not unlikely that some cases of supposed puerperal gangrene brought to the operating table for surgical treatment are in reality cases of ergotismus and manifestations of an idiosyncrasy to the drug.

The case here to be reported was caused by the administration of an ergot preparation, ergotamine tartrate, or "gynergen," as commercially called. The case was one of puerperal sepsis and its treatment 45 ampules of 0.0005 gynergen, one ampule every four hours was administered during a period of fourteen days.

Gynergen is the tartrate of the alkaloid ergotamine. It exerts in a profound manner all actions characterizing ergot. Unlike pituitary extract, it does not intensify uterine contractions already existing, but induces a continuous uterine spasm, which, though dangerous during

*Read at a meeting of the Brooklyn Gynecological Society, October 4, 1929.

the period the fetus or placenta is in utero, is nevertheless exceptionally desirable during the puerperium. The effects of gynergen appear to be more lasting, in contrast to the fleeting action of histamine. As a remedy in the treatment of postpartum hemorrhage to maintain firm and prolonged contractions, this specific alkaloid is apparently of more value than is pituitary extract.

CASE REPORT

P. F., a primipara, aged nineteen, of ample pelvic measurements and negative history, was admitted while in labor to the Brownsville and East New York Hospital on July 3, 1927. Her last menstrual period occurred on November 10, 1926. She delivered spontaneously, nine hours after onset of labor, of a normal living premature seven and a half months' infant. There were no lacerations, and the placenta was removed intact without subsequent hemorrhage. No anesthesia was used.

As routine, one dram of the fluid extract of ergot was given every four hours, for four doses; she received no further medication. The condition of the patient the day after delivery was good, and continued favorable until the evening when a large uterine clot was expelled. An hour later she suffered a chill lasting one-half hour which was soon followed by a temperature of 104° F. Measures usually employed for such conditions were ordered and a mild sedative given for the night. The next morning an examination revealed the following: The abdomen soft and nowhere sensitive; the uterus at the umbilicus, no rigidity but somewhat tender on deep pressure. Vaginal examination disclosed profuse red lochia with some clots but no odor; the vaginal vault and perineum intact. The cervix was in the proper axis, not lacerated; the external os readily admitted a finger; fornices and culdesac negative. A gynergen ampule of 0.0005 mg. subcutaneously was ordered every four hours for the conditions disclosed.

The patient's condition however, became increasingly worse. Chills appeared and recurred with great frequency. A glance at the temperature chart will reveal the seriousness of the condition. The persistent sepsis demanded radical measures and intravenous therapy, blood transfusions, etc., were prescribed.

In the early morning of the tenth or one week after labor, the condition of the patient remained unimproved. By this time she had received a total of 25 c.c. of gynergen and 6 drams of fluid extract of ergot. Toward noon of this day the upper and lower extremities became cold and cyanotic and the pulse very weak; the nails and toes were markedly cyanotic. In the evening, the pulse became weaker, thready, and at times imperceptible. At ten o'clock after another 2 c.c. of gynergen had been given, *radial pulse disappeared entirely*. The heart sounds were of very good quality, action regular, and adventitious sounds none; that cardiac state seemed contradictory to the character of the pulse and the state of the extremities.

On the following day, the eleventh of July, in spite of repeated stimulation, the radial pulse failed to return. On the twelfth, two days after the disappearance of the pulse, the patient complained of pain and stiffness in the big toes of both feet. The extremities were cold, the right foot cyanosed; there was numbness in all toes and tingling sensation in all fingers; external heat was applied in the hope of securing relief—but to no avail. Throughout these days, the blood pressure remained in the neighborhood of 100/60, blood cultures were consistently negative, blood counts showed a progressive anemia and temperature persisted high.

On the thirteenth with medication continued as heretofore, patient complained of severe pain in all toes especially of the right foot, morphia had to be administered. The radial pulse remained imperceptible, and the extremities cold. In the after-

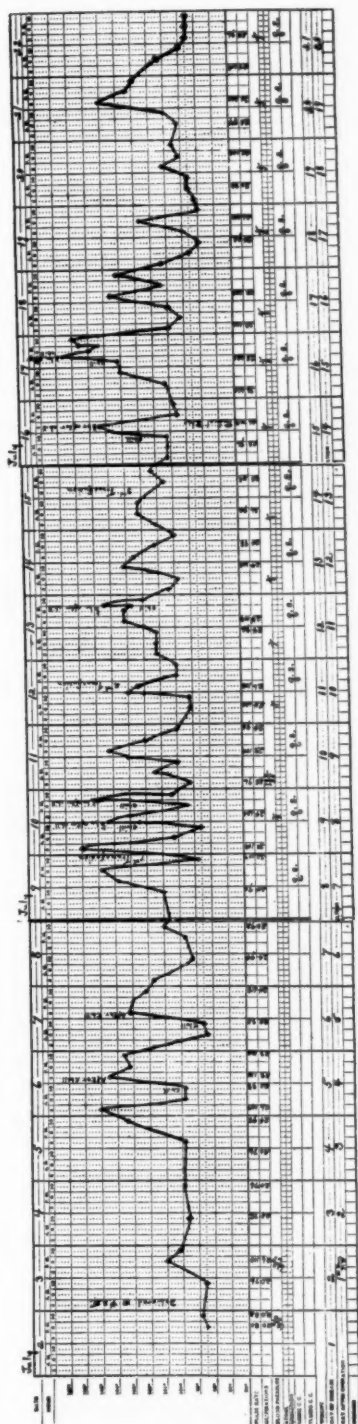


Fig. 1.—Temperature Chart.

noon the pain in the toes of the right foot became excruciating and discoloration of the toes and plantar surface, first blue, then green and later black also appeared. During the night, the fingers of both hands to the second phalangeal joint became cyanotic, and painful, but the general condition of the patient however appeared fair.

By the fourteenth of July 45 c.c. of gynergen had been administered subcutaneously. The radial pulse was still absent, the numbness in the fingers persisted, the toes were stiff and discolored, the patient drowsy and dull mentally.

Competent surgical consultants offered in explanation of the symptoms in the right foot and the vascular disturbance in the left the diagnosis of saddle thrombus of the common iliac. They advised immediate surgery to check the advancing process.

Before the operation the idea was suggested, that the condition might be due to an ergot idiosyncrasy and ergot gangrene. With the object of ruling this possibility out before the intended operation all medications including gynergen were discontinued.

Twenty-four hours after cessation of ergot therapy there occurred a remarkable change; the upper extremities became warmer, the numbness and tingling of the

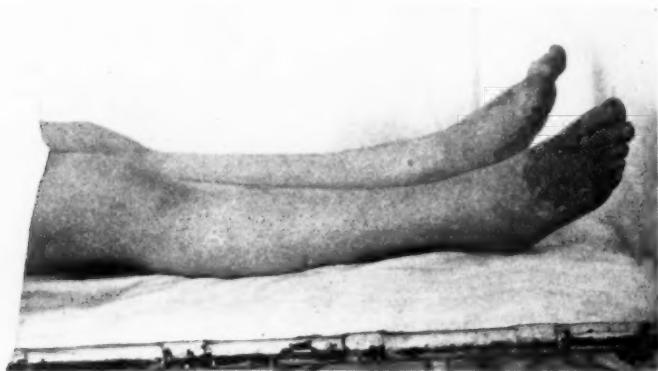


Fig. 2.—Showing line of demarcation in gangrene of both feet, the right more extensive than the left.

fingers less marked and the radial pulse returned, and of good quality. Soon the patient experienced better sensation in the left foot with less discoloration of the heel. The general condition of the patient was much improved. The pain in the right foot, however, continued severe, the process had apparently already progressed too far for it to recede.

On the following day, improvement in the right foot also became evident. There was better sensation from the heel to the ball of the foot, but from here to the toes there remained complete insensibility with blisters forming on the sole which later became a discharging sinus. The left foot had by this time completely recovered sensation and color. The radial pulse was of excellent quality. The patient was quite alert mentally.

On the nineteenth, the discoloration and demarcation on the right foot affected the distal half; complete gangrene of the deeper parts had not yet set in. It was thought that collateral circulation with local improvement might yet be established, for the sole had changed from black to a red mottling, pointing to a possible return of circulation. The left foot and upper extremities were by now entirely normal.

Local therapy and baking were employed and improved the condition con-

siderably; the only parts which were apparently definitely lost were the distal phalanges of the first three toes which subsequently did go through a process of spontaneous amputation.

On September 18 the patient requested to be discharged, her toes were still in the state mentioned; the base of the fourth and fifth toes was practically healed; the other parts showed exposed bone. A sinus at the sole of the foot was discharging. The patient was advised to return to the clinic for continued treatment.



Fig. 3.—Showing result two years later, with loss of all toes in right foot by spontaneous amputation and complete recovery in left foot.



Fig. 4.—Side view of right foot.

About a month later, on October 26 the patient was readmitted to the hospital. There was still the sinus at the ball of the foot and exposed bone was in evidence. The negative showed the missing terminal phalanx of the right great toe, the whole of the adjacent toe and the two terminal phalanges of the middle. All bones of the foot showed atrophy; the bone at the base of the fourth toe appeared somewhat rarified as was also the base of the small toe and the articular surface of the cuboid.

The patient was operated upon November 11 for the purpose of removing the stumps of the first, third and fourth toes, which were disarticulated at their metatarsal union. The sinus on the plantar surface was probed and found to

extend to the second and third metatarsal. A dorsal incision was therefore made to expose the third metatarsal which was found denuded and containing a small abscess. This metatarsal was also removed, the wound then packed with iodoform gauze. The patient made an uneventful recovery and left the hospital on December 10, but with the wound still in the process of healing.

The differential diagnosis between ergotismus gangrenosus and puerperal gangrene following blocking by a thrombus is not always an easy task. The case of puerperal gangrene described by Wormser illustrates this difficulty even to as keen an observer as Wormser. His case was as follows:

Healthy woman, para ii. First complains of pain in the calf of left leg six days after normal delivery. The saphenous vein was painful and hard; temperature 38.5 R, pulse 124. During the subsequent three days the condition remained unchanged. On the twelfth day of the puerperium, the foot became involved, the pain in the leg more severe with slight edema appearing. The following day the limb assumed a pale livid color and the toes and adjoining tissues became insensible. Gradually the whole foot became dark blue to black and this extended to beyond the ankle. On the thirty-ninth day of postpartum Bier's amputation of the leg was performed, the postmortem showing almost complete gangrene of the foot to the very malleoli. The cellular tissue was edematous, the musculature of grey brown color. The tibialis posticus contained no thrombi, but the arteria pedica had a solid, adherent thrombus. All the large veins were blocked with thrombi.

In our study of the toxicity of gynergen, a letter was forwarded to the manufacturers of the drug inquiring as to their experience regarding the toxicity of gynergen, and it brought the following reply, which might be of interest.

"It is of course a well-known pharmacologic fact that ergot may produce gangrene, but the therapeutic doses of gynergen and of fluid extract of ergot, U.S.P., are so far removed from the gangrene producing doses, that, contrary to what I believed before this review was made, it is very unlikely that ergot had anything to do with the etiology of the case in point. Gynergen, for instance, has been administered in doses exceeding 6 mg. (six tablets) per day for weeks and even months without untoward effects. Gynergen has literally been administered in millions of cases (especially in Europe) in doses of three to six tablets per day, yet I have not heard of any cases of ergotismus gangrenosus, although many patients must have had a similar constitution to that of the patient at the Brownsville Hospital. If ergot was actually the cause of the gangrene in your case, we would undoubtedly have had other similar reports."

However, a perusal of European literature on gynergen brought forward among others a report by Herbert Panter, entitled "*Tabetic Symptoms after Gynergen Injections*" (Med. Klin. 22: 880, 1926), which may be summarized as follows:

Two days before the removal of a right-sided goiter and the day following the operation, his patient received three ampules of gynergen daily. During the last afternoon, the patient suddenly felt noises in the ears, lost her pupillary reflexes with failure also of patellar and tendon reflexes. Since her Wassermann reaction was negative and no other grounds were available to explain the phenomena, these had

to be attributed to the gynergen therapy. When the gynergen was discontinued, the pupillary and patellar reflexes returned, and a week later normal conditions were completely restored. Panter concluded, that gynergen must have a peculiar selective action on the central nervous system.

COMMENT

A careful study of events in our case in their sequence must lead one to the conclusion that we are dealing here with an undoubted case of ergotamine poisoning; the prompt return to normal of affected parts after cessation of the administration of the offending agent must convert even the skeptical.

Leading authorities in toxicology state that ergot when given in therapeutic doses has no effect upon the organism except when in pregnant state, where it often induces uterine contraction with expulsion of contents. Usually, acute ergot poisoning is rare, but in cases where it is taken with the intent to induce abortion, the symptoms generally comprise collapse, weak, rapid pulse, tingling, itching and coldness of the skin, vomiting, diarrhea, confusion of mind and unconsciousness and, in addition, local symptoms, hemorrhage from the uterus and abortion. Ecchymosis in the subcutaneous tissues and internal organs was also observed. Occasionally after repeated small doses gangrene supervenes in such areas as the toe nails.

Chronic ergot poisoning was not uncommon some years ago; as a matter of fact, from time to time fairly widespread epidemics occurred as the result of the ingestion of bread containing ergot, especially after poor harvests and in wet seasons. Numerous instances of ergot gangrene epidemics are reported where the sufferers made pilgrimages from Europe to the Holy Land for a cure. There they received beside "religious blessings," also ergot-free bread, which enabled them to return home cured. The frequent occurrence of chronic ergot poisoning has enabled fairly accurate study of its symptomology. Symptomatically, ergotism is divided into two fairly distinct and sharply defined groups, one with nervous manifestations and another with gangrene. At times both these forms are combined, but most usual there is a prevalence of the gangrenous type, the local gangrene is preceded by coldness, discoloration, and numbness, to be finally followed by complete blackness and anesthesia of the parts involved. The gangrene often affects the limbs, but especially the fingers and toes. Sometimes a gangrenous organ will drop off with little or no hemorrhage. Gangrene of the internal organs also occurs and shows itself in cataract of the eye, ulcers in the bowel, stomach, lung or uterus. Abortion is rarely observed in the course of chronic ergot poisoning, and pregnancy seems to run its ordinary course in many cases.

In the nervous form, the first symptoms are depression, weakness, and drowsiness, then headache and giddiness, painful cramps in the limbs and fornication. In severe cases paroxysmal convulsions set in,

generally clonic but often epileptiform, leaving as sequelae contractions, etc. Some mental weakness, rarely amounting to real dementia, often follows recovery from ergot poisoning. It is generally conceded that the gangrenous type is the more characteristic and the more frequent of the two.

The action of ergot or ergotoxine upon the living organism resembles that of adrenalin, in so far, as like it, it acts on the myoneural junction of the sympathetic nerve. But while adrenalin stimulates the junctions, whether motor or inhibitory, ergotoxine does not affect the inhibitory but only the motor; and whereas it stimulates these in small doses, it depresses them in larger: It is also less powerful than adrenalin, though longer lasting. Ergotoxin, unlike adrenalin, taken over long periods, is capable of producing gangrene in distal parts of the body, the toes, fingers and nose, the gangrene presumably being due to prolonged constriction of arterioles, shutting off the blood supply to the parts affected. In larger vessels it causes occlusion of the lumen by hyaline thrombi produced by its toxic effect upon the vascular endothelium.

CONCLUSIONS

While ergotismus gangrenosus is of rather rare occurrence, occasionally such cases do occur, and should be kept in mind.

Where ergot in any form must be prescribed over a long period of time, symptoms of its toxicity should be thought of early.

Like many other drugs, patients may have an idiosyncrasy to ergot, and the complaining of the early symptoms of poisoning should not be ignored.

The differential diagnosis between ergotismus gangrenosus and puerperal gangrene is very difficult. The therapeutic test is practically the only means that can be employed to make the diagnosis.

REFERENCES

- Clouting, E. S.*: Philadelphia M. J. 6: 357, 1900. *Gorman, F. M.*: Philadelphia M. J. 6: 681, 1900. *Emsheimer, H. W.*: New York M. J. 102: 1245, 1915. *Pammel, L. H.*: Vet. Med. 16: 47, 1921. *Kaertnig, William*: Klin. Wehnschr. 11: 1160, 1923. *Zollner, E. L.*: Deutsche med. Wehnschr. 36, 1924. *Panter, Herbert*: Med. Klin. 22: 880-881, 1926. *Heyer, Eugene*: Zentralbl. f. Gynäk. 27, 1927. *Kienlin, M. H.*: Zentralbl. f. Gynäk., 10, 1928. *Spiegel, Theodor*: Zentralbl. f. Gynäk., 46, 1928. *Saenger, Hans*: Zentralbl. f. Gynäk., 10, 1929.

861 ST. MARKS AVENUE.

A PROPERITONEAL CYST (PROBABLY OF TRAUMATIC
ORIGIN) ASSOCIATED WITH A FIBROMA OF
THE OVARY

BY KARL H. MARTZLOFF, M.D., PORTLAND, OREGON

(From the Department of Surgery and Surgical Pathology of the University of
Oregon Medical School)

THIS case should be of interest for several reasons: (1) the composite pathologic picture which it presents is very rare; (2) the ovarian fibroma occupied an unusual situation; and (3) the accumulation of properitoneal fluid was probably the result of traumatism caused by the use of a motorized vibratory device of a recently popularized design and intended to do away with superfluous fat.

CASE REPORT

F. M., a white woman, twenty-six years of age, was first seen by me June 11, 1928.

The family history was entirely irrelevant. The past history also was negative except for a successful appendectomy with drainage, performed when the patient was eight years of age and after which she had had no further abdominal symptoms.

The complaint for which the patient was originally seen began at the time of her marriage, about fourteen weeks before, when sexual intercourse was found to be so painful as to be practically prohibitive. The general physical examination was essentially negative except for a true vaginismus. Combined pelvic examination and treatment were instituted (June 23, 1928) under general anesthesia ($N_2O + O$); at this time the uterus and its adnexa presented essentially normal palpatory outlines.

Recovery was uneventful, and the patient was without further complaint until October 19, 1928, when, following the use of a "health motor" for abdominal massage, she began to have some lower abdominal discomfort. The pain was rather general across the abdomen below the level of the umbilicus and was of a dull aching character. There was no radiation of the discomfort and she gave no history of gastrointestinal or urinary symptoms.

Physical Examination.—Pulse, temperature and respiration normal. Abdominal examination revealed a right rectus scar without hernia formation but with a definite asymmetry rendering the right side of the abdomen more rounded than the left. In fact the left half of the abdomen appeared flattened both at rest and during forced respiration. On palpation there was definite tenderness and rigidity, most marked just below the level of the umbilicus, in the left midclavicular line. This extended out to the left anterior axillary line, beyond which no tenderness or rigidity was elicited. The tenderness was no less pronounced when the muscles were tensed than when they were relaxed. There was no tenderness in the left hypochondrium, in the left suprainguinal region, or immediately above the pubes. No ecchymoses were visible. There was no muscle spasm or cutaneous hyperesthesia, and the presence of percussion discomfort was not ascertained.

On October 24, 1928, the symptoms were still persisting, and in addition there was complaint of some dysuria and frequency, but no discomfort after micturi-

tion and no sense of incomplete emptying of the bladder. The temperature was 99.2° F. Leucocytes 6,750 with a normal differential formula. The results of abdominal examination were the same as on October 19, and on this day percussion caused no discomfort and revealed no abnormal areas of dullness. On pelvic examination the uterus was found to be in anterior position forming an acute angle with the cervix. The parametria were apparently clear. A catheterized specimen of urine was normal on microscopic and bacteriologic examination.

On November 7, 1928, the symptoms were the same, but at this time a symmetrical area of percussion dullness was made out, extending from the pubes to

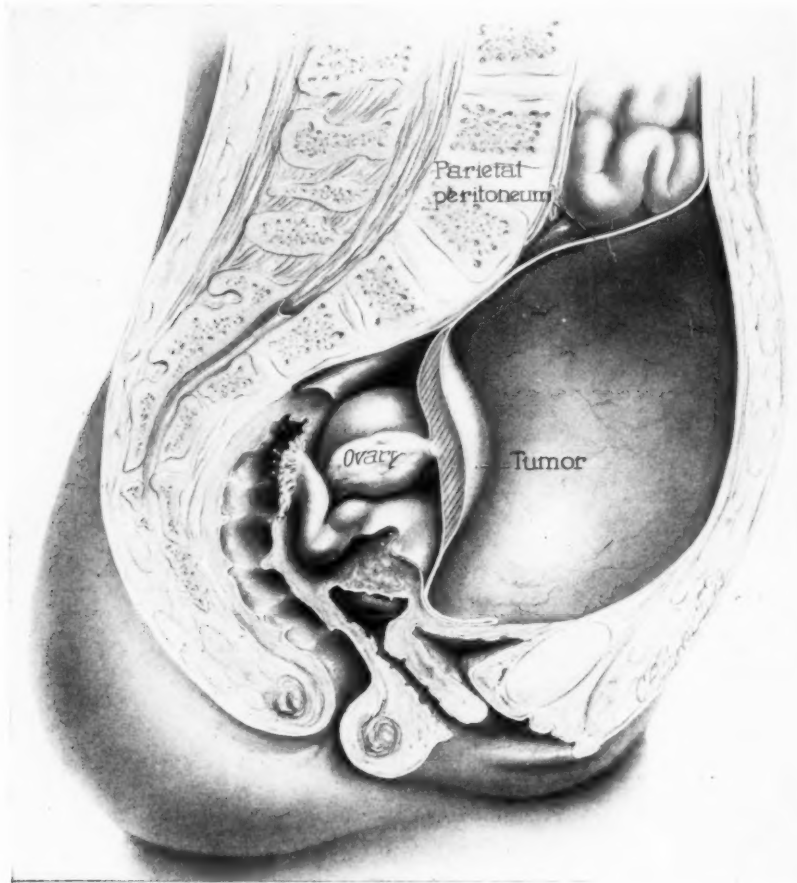


Fig. 1.—Schematic drawing in sagittal section to the right of the midline of the condition found at operation. The drawing is inaccurate in that the ovarian attachment to the tumor should be near the superior margin of the latter and the superior margin of reflection of the parietal peritoneum should be slightly below the level of the umbilicus.

the umbilicus. The superior margin of this dull zone had a regularly convex contour which persisted after catheterization of the bladder. On pelvic examination the uterus was found in third degree retroversion, and a large fluctuant elastic mass extending to the umbilical level was outlined in front to the right of the uterus.

A diagnosis was made of "ovarian cyst, possibly a dermoid."

Operation.—November 16, 1928. A midline infraumbilical incision was made, and large tortuous veins were encountered in the properitoneal tissues. These were cut between presection ligatures of No. 00 plain catgut, and it was my impression that we were approaching an ovarian cyst with an established collateral circulation through adhesions to the parietal peritoneum. Since the cyst could not be separated from the parietal peritoneum, a small incision was made through its wall. This was followed by a gush of reddish fluid, and on aspiration slightly more than 2.5 liters were withdrawn. A wider incision then disclosed a cyst cavity, the anterior wall of which was formed by the anterior abdominal wall but lacking its peritoneal covering. The remainder of the cyst wall was composed of reflected anterior parietal peritoneum as shown in Fig. 1. This peritoneal reflection extended from within a few centimeters from the umbilicus to the space of Retzius and from about the anterior axillary line on the left to a point midway between the midclavicular and anterior axillary lines, on the right. This latter limitation was due to dense adhesions about the site of the previous appendix operation.

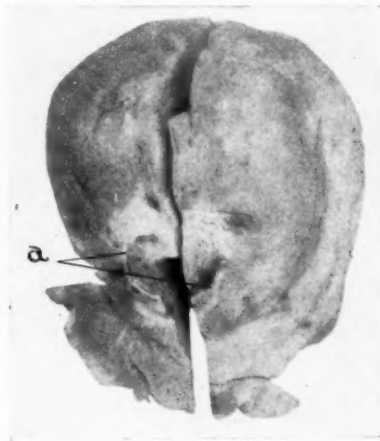


Fig. 2.—Photograph of posterior aspect of the tumor. At *a* is seen the site of its former attachment to the right ovary.

The cyst was smooth walled, and on its posterior wall in the midline was seen a glistening grayish-yellow area, measuring between 7 and 8 cm. in its greatest dimension. On palpation this was diagnosed as a tumor mass.

At the superior angle of the incision a small opening was made through the parietal peritoneum into the peritoneal cavity. Through this the reflected peritoneum could be displaced anteriorly and inferiorly, and the uterus was found to be in the third degree retroposition with essentially normal adnexa except for the right ovary which was attached, near its superior pole, by a broad stout pedicle to the posterior upper aspect of the tumor mass previously noted.

The pedicle was cut and the tumor mass was removed from between the peritoneal layers. The peritoneum was readily separated except in the midline anteriorly, where it was firmly adherent and had to be removed with the mass. This left a defect several centimeters in area which was readily closed with an everting suture of No. 00 plain catgut leaving a smooth surface on the serosal aspect.

Several hematomata were found in the substance of the peritoneum where it formed the superior wall of the cyst. These were opened and evacuated. Careful inspection failed to reveal any bleeding points either on the denuded posterior aspect of the anterior abdominal wall or on the reflected peritoneum. The peritoneal

incision was closed and at the same time was sutured to the abdominal wall in the midline in order to facilitate obliteration of any dead space, and the usual abdominal wound closure was performed without drainage. Convalescence was uneventful except for some serosanguineous drainage from the inferior angle of the incision. This began ten days after the operation and persisted for forty-nine days. At the present time, one year after her operation, the patient feels entirely well.

Pathologic Examination.—The gross specimen consists of a tumor mass measuring $7.5 \times 6.5 \times 2.5$ cm. (Fig. 2). It is pale gray in color and rather soft in consistency. On section, the surfaces present a smooth, gray, translucent, homogeneous appearance, and scraping with the knife point meets with but little resistance because of fibrous stroma.

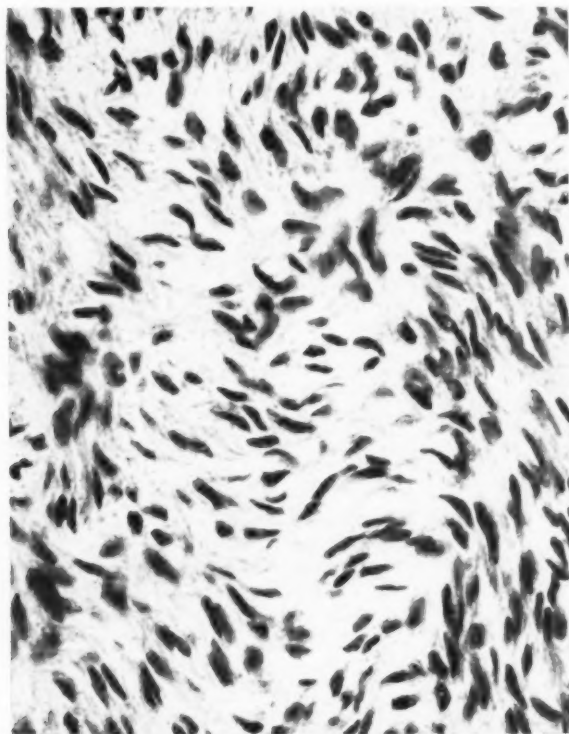


Fig. 3.—Photomicrograph showing the histologic characteristics of the tumor.

Sections for microscopic examination were made of formalin-fixed material and stained with hematoxylin and eosin. Sections taken through the area of attachment of the tumor to the ovary show that the tumor structure extends right up to the point of its operative amputation. The tumor is very cellular, being composed of spindle-shaped cells arranged in orderly whorls and wave-like strands with considerable intervening eosin-staining cytoplasm (Fig. 3). The nuclei are regular in size, shape and staining reaction, and no mitoses are seen. Other areas show some evidence of degeneration. The blood vessels are about normal. The surface of the tumor is represented by fibrocellular membrane which does not have the appearance of a true capsule. No ova or ovarian follicles are seen.

The tumor was considered to be a cellular fibroma without evidence of malignancy.

Dr. Frank Menne of our department of pathology and Dr. E. W. Goodpasture of the department of pathology of Vanderbilt University Medical School found the histologic structure of the tumor characteristic of ovarian stroma.

COMMENT

The case reported represents, we believe, a probable instance of injury to the abdominal wall followed by a properitoneal accumulation of blood-tinged fluid. The causative factor was probably a motorized device of popular pattern designed to give vibratory massage. This is accomplished by means of a belt-like strap which half encircles the trunk or limb, while each of the two ends is attached to an eccentrically situated knob, one on either side of an electric motor. When set in motion the motor causes a distinct jarring or vibratory sensation which is transmitted to the body by means of the tautly held half-encircling strap.

From the results in this case, it would appear that such motorized vibratory devices are certainly not entirely harmless when employed even by apparently healthy individuals.

The possibility of this cyst arising from an urachal cyst was considered, but nothing suggesting a urachus was seen at operation. Also no epithelial structures were noted in the microscopic sections from the surface of the tumor.

The fibroma lying in the layers of the anterior parietal peritoneum is probably merely a coincidental matter in so far as the properitoneal cyst is concerned. Most likely this tumor was present at the time of the pelvic examination under gas anesthesia but was not detected.

The occurrence of a midline fibroma as a neoplasm arising from the urachus would be, we believe, of particular rarity. However, the ovarian attachment of the tumor together with its histologic continuity makes it most probable that it was of ovarian origin. Its location in the peritoneal layers of the anterior abdominal wall is, we believe, altogether unusual, nor have we been able to find a counterpart in the available literature.

RUPTURED UTERUS WITH LIVING MOTHER AND BABY

TWO CASE REPORTS

BY CARL R. STEINKE, M.D., F.A.C.S., AKRON, OHIO

RUPTURE of the uterus following previous cesarean section is a sequel well worthy of recording in order that methods may be devised to avoid the catastrophe. Most observers agree that faulty healing in the uterine incision is the principal etiologic factor. This may be due to inclusion of decidual tissue, faulty suturing, or infection of the uterine incision. Several cases have shown a tearing of the uterine wall some centimeters to one side of the scar line through the myometrium. The implantation of the placenta may play a part, but this has not been determined. The rupture may take place any time after the beginning of the seventh month, without previous labor pains or other means of warning.

The mortality is estimated from the reported cases to be 50 per cent for the mothers and 90 per cent for the infants, and with this fact in mind I felt the following cases should be recorded.

CASE 1.—Mrs. O. W. P., white, thirty-one years of age, had one normal birth nine and one-half years previously, followed in one and one-half years by curettage, trachelorrhaphy and appendectomy. Three years after this operation cesarean section for placenta previa was performed elsewhere; therefore, no facts are available as to the method of suturing the uterus. She said there was fever for several days following the operation.

On January 31, 1926, she was sent to the City Hospital in labor at full term. The pains were normal for a time when suddenly she developed inertia. Dr. C. N. Long, who was attending her, made a diagnosis of ruptured uterus and ordered preparation for operation, which took place as soon as possible.

Upon opening the peritoneum I found the fundus torn its full length and everted down to the cervix. The placenta was attached on the posterior portion of the uterine cavity, while the baby lay free in the abdomen. There was very little hemorrhage. A complete hysterectomy, including both tubes and left ovary, was performed (Figs. 1 and 2). The mother made a good recovery, and the baby is now a healthy girl of four years.

Pathologic report by Dr. T. H. Boughton: A large uterus showing a long ventral slit in the fundus. The upper part of the uterus is completely everted, and a large normal-looking placenta covers the outer portion of the everted uterine mucosa. The cervix is dilated sufficiently to admit one finger and is not everted. The tubes are about normal in appearance. Diagnosis: Pregnant uterus with a long slit in the fundus and complete eversion of the upper portion. No decidual tissue was found in the uterine scar.

CASE 2.—Mrs. F. K., white, thirty-eight years of age, had a cholecystotomy in February, 1923, followed by a cholecystectomy two months later. There were nine living and two dead children, with two miscarriages before this pregnancy. Her health was always fairly good during pregnancy except for some nausea and vomiting and slight edema of the hands and feet.

On June 28, 1924, there had been a cesarean section performed elsewhere, revealing a partially detached placenta, a portion of which extended over the cervical canal. The operation was done through a median incision with an opening made on the anterior portion of the fundus. The uterus was closed in three layers with single chromic catgut. The abdomen was closed in layers with catgut and silk-worm gut. The baby weighed 4 pounds 10½ ounces. There was considerable fever following, the temperature going as high as 104.8° F. the following day and 101.4° the succeeding day. The temperature gradually came down to normal by July 13. The lochia was reported as offensive on the third day.

The abdominal incision healed following some infection, but later developed a postoperative hernia. The urine was normal during her stay in the hospital, and the highest white blood count was 17,600. She had one normal delivery about two and one-half years after the cesarean.

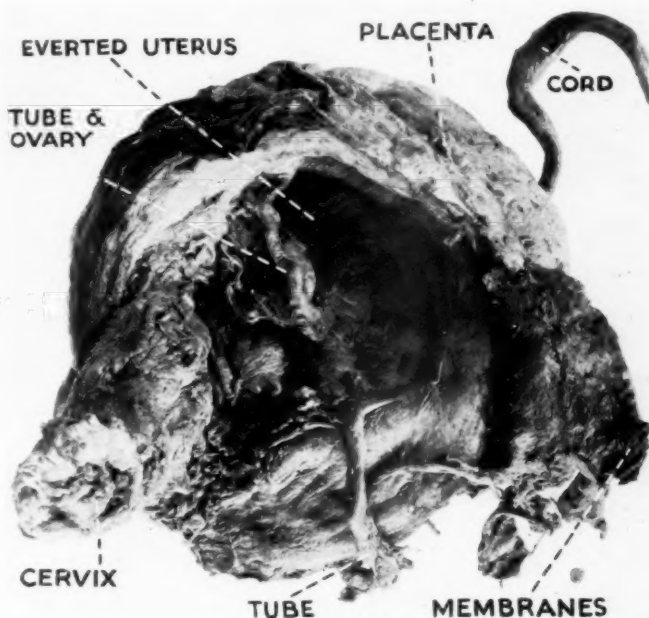


Fig. 1.—Case 1.

Her last menstruation began June 4, 1927, and she went into labor March 18, 1928. There were several severe pains followed by shock and cessation of the pains. The baby could be felt high in the abdomen, so Dr. S. Greenfield, who was attending the patient, diagnosed a ruptured uterus, and sent her to the People's Hospital for immediate operation. The urine showed a faint trace of albumin but was otherwise negative. The white blood count was 18,300 and the hemoglobin 60 per cent. I opened the abdomen and found a 9 pound 5 ounce baby lying free in the abdominal cavity. The baby and placenta were removed. The scar in the uterus from the previous cesarean section had split wide open with the placenta attached on the posterior uterine wall. There was very little free blood present. The omentum was adherent in the upper abdomen at the site of the previous gall bladder operations. The abdominal wall was very thin and stretched, the result of the previous pregnancies and the ventral hernia. Supracervical hysterectomy with both tubes and ovaries was performed, and a strip of the lower abdominal wall 5

inches wide resected, suturing the fascial planes and muscles with chromic catgut. Figure-of-eight tension sutures of silkworm were then inserted, and the skin was closed with dermal suture. A piece of rubber tissue was inserted under the skin for drainage.

The second day the rectal temperature rose to 101.6° F. but gradually returned to normal by March 23, followed by a good recovery. The mother is well, but the baby died of measles two years later.

Pathologic report by Dr. F. C. Potter: The placenta measures 18 cm. in diameter by 2 cm. in thickness. The attached cord measures 60 cm. in length and 1 cm. in diameter. The borders are thin. It contains many gray sclerotic patches. The uterus (supracervical) measures 15 × 14 cm. One surface (probably the

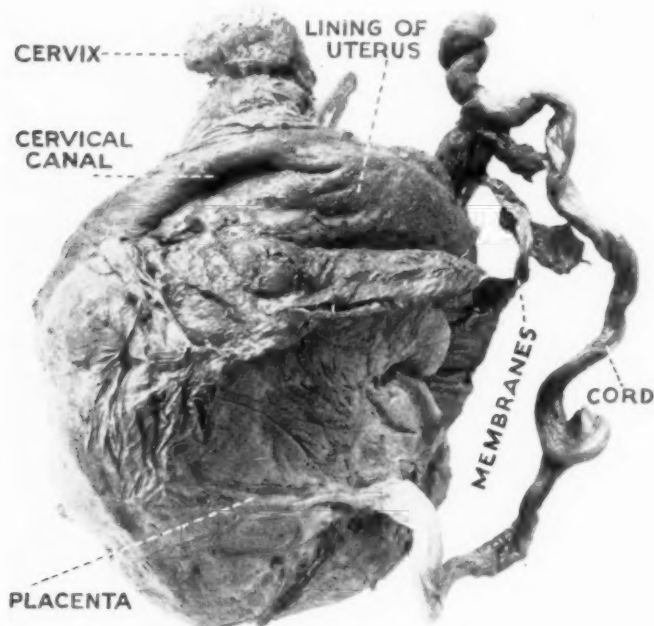


Fig. 2.—Case 1.

anterior) contains an irregular, torn opening measuring 7 × 4 cm. The borders of the torn area are ragged and thin. On section the borders have the appearance of an old scar. The cavity is large. The left tube measures 14 × 3 cm. The fimbria is patent. On section the wall is a little thickened. The lumen is small. The left ovary measures 4.5 × 2.5 cm. The right tube measures 10 × 0.6 cm. One cyst is attached along the border. It resembles its fellow. The right ovary measures 3.5 × 2 cm. It contains numerous sacs filled with clear fluid and gray corpora lutei. Accompanying this specimen are two irregular masses of skin and subcutaneous fat, measuring about 15 × 5 cm. each. Microscopic: Ovary: The outer border is made up of fibrotic ovarian tissue within which is a ring-like mass of degenerating corpus luteum whose inner wall is made up of a rather broad band of compact connective tissue. Uterus: These sections are made up of two loosely arranged masses of uterine muscle, both of which show moderate interstitial fibrosis.

Between the two masses of muscle there is a broad band of pale fibrous tissue with very few nuclei. One surface is partly covered with organizing blood clot. Placenta: Sections show marked fibrotic changes, with only remnants of placental tissue. There is no evidence of choriomatous changes. *Diagnosis:* Ruptured uterus. Sclerosis of placenta. Corpus luteum of pregnancy.

SECOND NATIONAL BUILDING.

FETAL DYSTOCIA DUE TO METASTATIC NEUROBLASTOMA OF THE LIVER*

By HENRY T. HAGSTROM, M.D., BROOKLYN, N. Y.

(*First Obstetrical Service Methodist Episcopal Hospital*)

THIS case is presented as an instance of dystocia due to an hypertrophied liver in the fetus, as a result of a metastatic newgrowth from a congenital tumor of the suprarenal gland. Difficult labor because of a greatly enlarged fetal liver is so rare that a report seems justified. After a fairly extensive review of the literature I have been unable to find any record of a similar case.

CASE REPORT

Mrs. D. S., aged thirty-nine, gravida viii, para vii, was seen in consultation at home about 4 A.M., February 13, because of failure to make progress after twenty-four hours of labor. This pregnancy had been normal throughout, and pelvic measurements were ample. The patient's general condition appeared good, though she was tired. Pains were coming every three to four minutes.

An examination of the abdomen revealed an apparently large baby, lying obliquely from right to left, with a hard, round, ballotable mass corresponding to fetal head, occupying the fundus of the uterus. Another more fixed mass filled the left side of the pelvis. The baby's back was toward the left.

An examination by rectum revealed a roomy pelvis, with the cervix nearly effaced and three fingers' dilated. The membranes were intact. The fetus lay in a transverse position with a foot apparently presenting. In addition there was an obstructing tumor at about the level of the superior strait.

Because of the unusual complication present, it was decided to transfer the patient to a hospital. Accordingly she was given $\frac{1}{4}$ gr. of morphine sulphate to secure rest, and transported by ambulance to the Methodist Episcopal Hospital.

After admission labor pains diminished in frequency and intensity for two and a half hours, then active labor ensued, with pains every three minutes. At 9 A.M. when the cervix was about fully dilated and well effaced, the patient was taken to the delivery room to determine the exact presentation and the nature of the mass obstructing the inlet. The membranes were then ruptured. A left footling presentation was confirmed. Upon further investigation the right foot was easily felt and brought down alongside the presenting left foot. With moderate traction and uterine contractions the presenting parts could not be delivered beyond the mid-portion of the baby's thighs. Further efforts in extracting the breech were futile because of some obstruction evidently associated with the body of the child.

*Read before the Brooklyn Gynecological Society, December 6, 1929.

On passing the examining fingers up over the baby's abdomen a hard, dome-shaped swelling could be made out, wedged in the pelvic inlet. Externally it could be felt above the symphysis. As it was quite certain that the dystocia was due to a large abdominal tumor and that delivery without evisceration was impossible, the baby's abdomen was incised with a pair of scissors. On exploration there was revealed a hard, nodular mass almost filling the abdominal cavity. Portions of the tumor were removed until it was reduced sufficiently in size to permit completion of the breech delivery without difficulty.



Fig. 1.—Photomicrograph, low power, of section of suprarenal gland showing capsule, and cortex being invaded by medullary tumor cells.

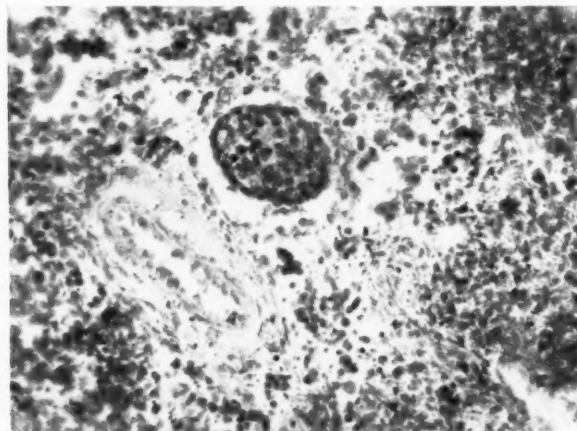


Fig. 2.—Photomicrograph of section of suprarenal gland, showing invasion of lymph vessel by tumor cells.

The pathologic report by Dr. Esmond Smith is essentially as follows:

Thorax.—The chest is barrel shaped with an increased anteroposterior diameter due to pressure of a tumor in the upper abdomen. The heart, thymus and lungs are normal.

Abdomen.—The abdomen is markedly distended by a mass in the upper abdomen. There is a long, ragged, transverse incision in the lower abdomen. Through the incision protrudes a part of the tumor, which is seen to be the liver. Practically

the entire abdomen is filled and distended by the greatly enlarged liver. Upon removal it is found to weigh 700 gm. and measures 14 by 12 by 6 cm. Several fragments were torn off during the evisceration. The capsule of the liver is not thickened. The surface is slightly nodular. Most of the normal brown surface is replaced by irregular white areas and nodules. On section the liver is moderately firm and the cut surface presents an appearance somewhat like granite. It is composed chiefly of irregularly shaped white areas varying from 1 to 2 mm. to 1 cm. in diameter, separated by areas of brownish-greenish liver tissue. Grossly, this looks like a liver riddled with metastatic growths. Stomach and intestines are compressed into a small mass in the rear of the abdomen, and the intestines are only a few millimeters in diameter. The right kidney is normal. The right adrenal is missing. In its place is a round tumor measuring 6 by 6 by 5 cm. It is attached to the upper pole of the kidney by a short, fibrous pedicle. The tumor is encapsulated, solid, dark red and on section is homogeneous, without visible structural details and looks somewhat like a blood clot.

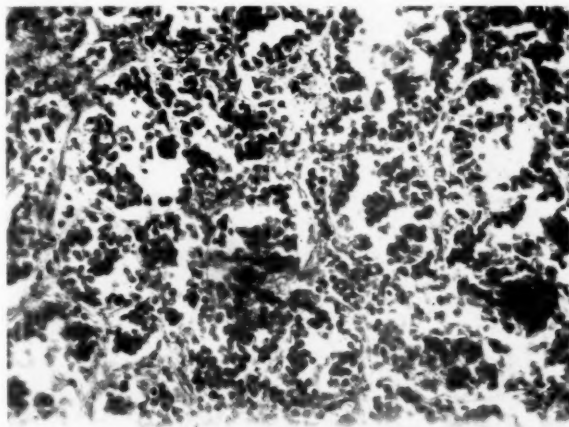


Fig. 3.—Photomicrograph of section of metastasis to liver showing pseudorosettes.

Microscopic.—Adrenal: Practically the entire gland has been destroyed by a newgrowth. Portions of the capsule and cortex are found in spots. The tumor consists of round cells slightly larger than lymphocytes. They are arranged in small groups, sometimes in the form of pseudorosettes. Under high power they are seen to consist of round or oval nuclei with an eccentric nucleolus and chromatin network. Only a few cells show traces of cytoplasm. There is marked extravasation of blood.

Liver: Much of the liver tissue has been replaced by a newgrowth composed of cells similar to those in the adrenal tumor, with the same grouping of the cells. There are many extravasated red blood cells.

Diagnosis.—Congenital sympathicoblastoma of the right adrenal, Pepper type.

According to Ewing, these cases fall clinically into the two groups of adrenal neurocytoma known as the Pepper and Hutchinson types.

In the Pepper type, as illustrated by the case herewith presented, the tumor is usually in the right adrenal with extensive metastasis in the liver. In the Hutchinson type the tumor is more frequently in the

left adrenal and there are metastases to other organs, but particularly the ribs and cranium. Histologically they have the structure of embryonal neuroepithelium. Since most of the tumor cells are of the non-differentiated nerve cell type it is by some authorities classed as a sympathicoblastoma.

The case here reported shows a primary tumor of the right suprarenal gland with metastasis to the liver, which was so enlarged as to preclude normal delivery.

REFERENCES

- (1) *Mersenbach, J.*: Week. Med. Rev. 9: 433, 1884. (2) *Pepper, William*: Am. J. M. Sc. 121: 287, 1901. (3) *Sophr, O.*: Arch. Path. 4: 207, 1927. (4) *Ewing, J.*: Neoplastic Diseases, 1928, W. B. Saunders Co.

52 EIGHTH AVENUE.

INCARCERATED RETROVERSION ASSOCIATED WITH PREGNANCY*

BY ADOLPH JACOBY, M.D., F.A.C.S., NEW YORK, N. Y.

(Assistant Professor of Gynecology, New York Post-Graduate Medical School and Hospital)

THE patient was thirty-four years old, married two years and had never been pregnant. She began to menstruate at the age of twelve years; her menstrual periods were regular every twenty-eight days, lasting three days, moderate in amount. Last period September 19, 1927.

On November 1, she began to feel nauseated and vomited occasionally. This continued until the middle of November. After that she felt well until the first of January. The patient then noticed that the abdomen was beginning to swell, and at the same time she felt distressed and was unable to void, although she had the desire to do so. Shortly thereafter she voided a small amount with much pain, but with no straining. The patient took some spirits of niter and hot douches and felt better for a short time. The symptoms returned. She then consulted a doctor who prescribed urotropin, which for some unknown reason improved the condition for a few days, and then the difficulty in voiding and pain returned.

Three weeks later the swelling increased. She then consulted one of the city clinics, where she was given some tablets and advised to have an x-ray taken to determine whether she had an ovarian cyst or was pregnant. The first x-ray showed a mass, no fetal parts. A uterosalpingogram was then attempted but could not be done as the uterus could not be injected.

On January 19, the patient applied for treatment in the Gynecological Department of the New York Post-Graduate Hospital. Her chief complaint at that time was distention of the abdomen, sharp pain all through the lower abdomen, and difficulty in voiding. She could void without pain or difficulty on lying down. She had no backache, no constipation or discharge and no pressure sensation in the

*From the Department of Gynecology, New York Post-Graduate Medical School and Hospital.

Read at the New York Academy of Medicine, Section of Gynecology and Obstetrics, April 23, 1929.

back. The patient had to walk doubled over. Up to the time of appearing at our clinic, the patient had never been catheterized.

The patient stated that she had voided five minutes before getting on the table for examination. On examination the first thing noted was the swelling of the abdomen reaching about one inch above the umbilicus. The peculiarity of the swelling was the abrupt rise of the convexity from the superior border of the symphysis. A short metal self-retaining catheter was introduced and about 500 c.c. of urine was withdrawn. No very appreciable change in the swelling was evident. Not feeling satisfied with the result of this catheterization, the metal catheter was withdrawn. A soft rubber catheter was introduced and about 1500 c.c. more of urine was obtained. The swelling then largely subsided.

On vaginal examination, the first thing to meet the examining finger was a marked swelling just within the introitus on the posterior vaginal wall. On passing the protrusion and feeling for the cervix in the usual position, it could not be found. On deeper palpation, the cervix was found high up near the upper border of the symphysis, jammed hard against the under surface with the body of the uterus acutely retroflexed and in the hollow of the sacrum. The uterus was enlarged, soft and reached midway to the umbilicus and was evidently pregnant. An attempt was made to dislodge the uterus in the dorsal position but was not successful. The patient was then put in the knee-chest position and another attempt to dislodge the uterus manually was again unsuccessful. She was then admitted to the service of Dr. Walter T. Dannreuther and subsequently operated upon.

The abdomen was opened in the midline, the upper limits of the incision extending to the left of the umbilicus. The peritoneum was opened just below the umbilicus. A very much thickened, hypertrophied bladder was presented immediately beneath the wound. The bladder had been carried high up in the abdominal cavity by the pre-existing distension. The examining hand was carefully insinuated under the fundus of the uterus: the top reached almost to the level of the umbilicus, and an incarcerated sacculation of the posterior wall filling the culdesae and true pelvis was discovered. This was not adherent but was dislodged with difficulty. The elasticity of the uterine wall then allowed a return to the normal outline, and the culdesae was no longer distended, exerting upward pressure on the cervix. The left tube and ovary were lifted up, examined, and seemed to be normal. The bladder displacement was then seen to be due partly to an underlying intraligamentous cyst in the right broad ligament, which contained a large number of greatly dilated veins. The cyst was brought up into the wound as far as possible, walled off with laparotomy pads, and the contents evacuated. (This step was taken because the pedicle could not be exposed, owing to the pregnant uterus occupying so much space in the pelvis.) The contents of the cyst were of clear, mucinous, watery material.

The head of the cecum was then seen to be adherent to the posterior surface of the cyst wall and was easily separated. The appendix was also involved in the inflammatory exudate and was removed in the usual manner: clamping, ligating the meso-appendix; ligating and amputating the appendix with inversion of stump. The cyst was then clamped as low down in the broad ligament as possible and ligated with No. 2 chromic double interlocking mattress sutures. The pelvis and right iliac fossa were wiped dry and seemed to be free from bleeding.

Peritoneum was closed with No. 2 plain catgut doubled; fascia with No. 2 chromic catgut single; skin with black silk reinforced with three silkworm gut sutures.

Pathologic examination of the tissues removed showed chronic appendicitis and parovarian cyst.

For five days after the operation it was necessary to catheterize the patient. The amount withdrawn was between 2 c.c. and 400 c.c. at each catheterization. On the fifth day the patient voided and continued to void thereafter without pain or discomfort.

She made an uneventful recovery and was up and about in eleven days. On February 24, 1928, she was examined. The fetal heart was heard midway between the umbilicus and pubis. The lower uterine segment was not flattened. The culdesac was free. Fetal movements and ballottement were easily determined.

On April 6, 1928, she was again examined. The cervix was back and pointed toward the hollow of the sacrum. There was no tension in the pelvis; the fetal head was palpable, and ballottement was easily elicited. The uterus reached midway to the ensiform cartilage. The patient was referred to New York Nursery and Child's Hospital for delivery.

On November 9, 1928, she again reported for examination. During that time she had given birth to a baby boy at New York Nursery and Child's Hospital. The delivery was entirely uneventful. The perineum was lacerated at the time of delivery and repaired immediately. The puerperium was normal. She was in the hospital for twelve days. She felt fine and had no bladder symptoms. The abdominal wall was firm. The perineum practically intact; the cervix was very slightly lacerated and pointed forward. The uterus was retroflexed, small, replaceable, but immediately dropped back into its original position. Evidently a congenital retroflexion.

SUMMARY

The points of interest brought out in this case are the following:

1. The importance and wisdom of preliminary catheterization before an initial pelvic examination.
2. The recognition of distention of the bladder and its differentiation from uterine enlargement by the abrupt convexity of the abdominal wall above the symphysis.
3. The reposition of the incarcerated pregnant uterus by operative procedure, without interference with the continuance of the pregnancy.
4. The resumption of normal bladder function.
5. The normal delivery of a healthy child at term.
6. The resumption of the retroverted position of the uterus after the birth of the child.

151 WEST SEVENTY-SEVENTH STREET.

REPORT OF A CASE OF RUPTURED UTERUS FOLLOWING
ATTEMPTED VERSION, WITH COMPLETE RECOVERY
OF THE MOTHER AND A LIVING CHILD*

BY MORRIS F. GOLDBERGER, M.D., NEW YORK, N. Y.

(From the Obstetric Department of St. Mark's Hospital)

RUPTURE of the pregnant uterus following an attempted internal version is not so unusual an occurrence as to warrant special comment beyond the fact that it is one of the tragedies of obstetrics. It is a tragedy because of its results: occasionally the death of the child, frequently the death of the mother and if she survives, it is followed by an emergency operation which usually leaves her minus the uterus.

The case I am about to report had an outcome so different to the foregoing picture, as to be adequate reason for this publication.

Mrs. S., aged thirty-eight, para iv, began her labor on the morning of July 2, 1929. Membranes had ruptured with the onset of labor and at 10 A.M. she was said to be fully dilated. Her three previous children had been delivered spontaneously without complications. At 1:00 P.M. three hours after she was said to be fully dilated, her attending physician consulted with me over the telephone, citing the case and asking for advice because of the fact that she had not yet delivered. After inquiring into the history of the previous deliveries, I advised waiting. About 4:00 P.M. of the same afternoon, I was called to see her at her home. The patient was found to be a rather stout woman with a pendulous abdomen, having regular contractions that were not particularly severe, vertex presenting in the left occipitoanterior position, but the presenting part was not in the pelvis. She was advised hospitalization and was admitted on my service at St. Mark's Hospital shortly thereafter.

Since the cervix was completely effaced and the uterus did not appear to be tightly contracted or to have lost all its liquor amnii, it was thought best to attempt an internal podalic version and breech extraction. In view of her previous history of normal deliveries and the fact that she had been seven hours fully dilated with membranes ruptured and with the possibility of infection due to conditions in her home previous to admission to the hospital, cesarean section was thought to be contraindicated. Accordingly the patient was prepared for delivery, ether anesthesia was administered and internal podalic version was begun. The hand in the uterus found both feet quite readily and brought them to the vulva without much difficulty and then the first obstruction to the procedure arose. The head would not travel upward into the fundus of the uterus but remained just above the symphysis, the feet being at the vulva, the child was in a jackknife position. Traction on the feet was found of no avail, so an attempt was made to guide the head up into the uterus by gentle manipulation with the outside hand. With the right hand externally on the abdomen, the head was slowly and gently guided in an upward direction. There seemed to be some progress when suddenly a new oval mass presented itself just to the left of the uterus, but apparently branching from it just above the symphysis, palpable and visible through the abdominal wall.

*Read before the New York Academy of Medicine, Section of Obstetrics and Gynecology, October 22, 1929.

Diagnosis of rupture of the uterus with fetal head in the peritoneal cavity was made and confirmed when vaginal examination revealed an absence of head in the lower uterine segment. While the anesthesia was continued, the operating room was prepared and in about twenty-five minutes we were ready for laparotomy.

The abdomen was opened in the median line below the umbilicus, a small amount of free blood was found and the head was seen protruding from the anterior surface of the uterus, above the vesicouterine reflection of peritoneum and a little to the left side. After packing off the general cavity as much as possible, the uterine tear was enlarged and the child lifted out as in a low cesarean section. The child made some respiratory efforts and to our surprise was resuscitated without much difficulty. With the child out of the way, the amount of uterine damage could be definitely determined, and it was seen that the rupture had begun low down behind the bladder on the right side and then extended obliquely upward toward the left, dissecting the bladder away from the lower uterine segment, lifting the peritoneal reflection upward, and finally coming through into the general cavity on the anterior surface just above the bladder and to the left. The placenta was removed and the irregular rent in the uterus was closed with two layers of chromic catgut sutures and the peritoneal reflection of the bladder was used to cover over the suture line, in the manner employed in doing the low flap cesarean operation (overlapping). A small gauze packing was left in the uterus and a fair sized cigarette drain was used going down to the anterior surface of the uterus. The abdomen was closed around this cigarette drain in the usual manner. The patient was put to bed in the Fowler position and a hypodermoclysis of 700 c.c. of normal saline was given at once. Fluids by rectum were given for several days, consisting of retention enemas of 5 per cent glucose and 2 per cent sodium bicarbonate solutions, and Murphy drip of saline solution. Small doses of fluid were given by mouth after twenty-four hours and morphine sulphate grain $\frac{1}{4}$ hypodermically was given for the relief of pain. The postoperative convalescence was somewhat disturbing, the abdomen becoming markedly distended, but enemas and pituitrin hypodermically were followed by prompt relief. On the third day the patient developed a severe cough with considerable expectoration but her general condition improved constantly. For a week the temperature varied between 99° and 101.6° F. and then came down to normal and stayed down. The pulse ranged from 100 to 130 during this period but was always of good quality. The packing, which had been placed in the uterus at the time of operation, came down into the vagina and was removed from there on the evening of July 5, three days after operation. The cigarette drain was gradually removed and the wound healed by primary intention.

The mother was out of bed on July 16, fifteen days after delivery. The baby was a lusty female child that weighed 7 pounds 15 ounces at birth, and while it had a temperature for two days due to inanition, it was discharged with its mother on July 19, seventeen days after operation, weighing 8 pounds 11 ounces, both mother and child in good condition.

127 EAST EIGHTY-FIRST STREET.

DERMATITIS FOLLOWING PACKING WITH IODOFORM GAUZE*

By N. B. SACKETT, M.D., NEW YORK, N. Y.

(From the Clinic of the Woman's Hospital)

IN THE literature of twenty or thirty years ago, when many granulating wounds, sinuses, and venereal ulcers were being treated with iodoform, we find many reports of iodoform poisoning.¹ Indeed Orfila² studied poisoning by iodine and its compounds in 1815, three years after the discovery of iodine by Courtois. Cutler³ collected 78 cases with a mortality of 34 per cent, and these reports bring out the frequency of symptoms referable to the gastrointestinal and central nervous systems, as well as the rarity of skin manifestations. Without taking up the researches of Bloch, Jadassohn, and Perutz⁴ on the causes of iodoform idiosyncrasy, we are struck by the paradox that while very large amounts have been given without intoxication, on the other hand poisoning even with fatal outcome has been observed after the smallest doses.² In recent years obstetricians and gynecologists have used gauze packing impregnated with iodoform in hundreds of cases; and yet reports of iodoform rash or any form of iodoform poisoning are rare. Among 2500 dermatologic cases in eight years Perutz found but one undoubted instance.⁴

CASE REPORT

Mrs. N. O. R., age thirty-eight, gravida ix, admitted to the Obstetrical Service of the Woman's Hospital on October 27, 1928. Her family history and personal history are irrelevant. Her past history includes: Three full-term pregnancies and five spontaneous abortions; and an operation in 1921 for plastic repair and retroversion, when marked general visceroptosis was noted. Influenza in 1918 is the only disease reported; and her blood Wassermann, vaginal and cervical smears have always been negative for syphilis and gonorrhea. Of special interest to this report is her statement that sixteen years before, "after taking quinine for a cold," she had an eruption confined to the face, lasting one week and similar to the rash to be recorded below, excepting that—to use her words—it was "more in ring forms."

This last, or ninth pregnancy presented mild toxemia symptoms, not alarming until date of admission when she entered *not* in labor, complaining of headache, obscure vision, swollen, painful ankles, and vomiting. Her blood pressure was 125/80, she received an enema and a colon irrigation; and after two hours went into labor which lasted four hours and thirty-five minutes. Light drop ether was used in the easy, spontaneous delivery of an 8½ pound baby. After delivery of the placenta, the patient bled considerably and had a second ampoule of pituitary extract in addition to the usual pituitary and ergot medications. The total loss of blood was estimated at 350 c.c.; and one hour after delivery the patient was back in bed with uterus firm and bleeding very slight.

Four and one-half hours after delivery, however, the patient had a third degree postpartum hemorrhage estimated at 1200 to 1500 c.c., and was returned to the delivery room for tamponade. Under light drop ether on open cone (about 2 oz.) the

*Read by invitation before the Obstetrical and Gynecological Section of the New York Academy of Medicine on March 26, 1929.

uterus was explored, then packed with 8 yards of two-inch gauze packing impregnated with about 7 per cent of iodoform, the remaining two yards of the one strip being packed into the vagina. During the operation she received 200 c.c. of gum glucose intravenously and within the next thirty minutes 500 c.c. of whole blood. Her condition subsequently was never dangerous.

This report was suggested by the occurrence fifty-four hours after delivery, forty-eight hours after the tamponade, of a rash on the face. Appearing first on the right side, within five hours it involved both cheeks, bridge of the nose, circumoral region, and chin; but at no time was there the least abnormality of the skin of the rest of the body. At first herpetiform and papular, it soon became vesicular and finally resembled a moist eczema. Itching and burning were present with variable intensity; but although many vesicles were found inside the mouth and on the tongue, there was no complaint of bad taste or anorexia, nor was there any bad odor of the breath. Unfortunately no iodine tests were made on the urine or saliva. Dr. A. B. Cannon, called in consultation, made the diagnosis of dermatitis medicamentosa, probably absorption from iodoform dressing, and recommended light diet, forced fluids, saline laxatives, sodium chloride, gr. 5, t.i.d., a mouth wash, and a lotion for the face.

The packing was removed, 4 yards in forty hours, 3 yards in fifty-eight hours, and the remainder seventy-seven hours or three days and five hours after the tamponade. The temperature never rose above 99.6 degrees by mouth, the pulse rose to 120 on the second day postpartum, then gradually fell to 90 by the fourth day. Respirations normal throughout. The rash remained at its height for three days; then it gradually dried up, but persisted as red blotches with irregular desquamation until discharge from the hospital on the fourteenth day. No vestige remained at her first follow-up visit, twenty-five days after delivery.

DISCUSSION

This case is presented, first, because of the infrequency of iodoform poisoning, especially of its skin manifestations in modern obstetric and gynecologic practice; second, because its distribution was limited instead of generalized; and third, because the usual mental depression, refusal to take food, bad taste in the mouth, foul breath, very high or very low temperature, rapid weak pulse, and appearance of general intoxication were here conspicuously absent.

Finally to repeat the caution⁵ expressed many years ago, the least possible quantity of iodoform should be used, renewed only very rarely and removed at the first sign of intoxication. Extra precautions should be observed in the case of obese or debilitated, very young or very old subjects, or those affected with cardiac or renal disease. As a logical part of these precautions, the present widely varying strengths of iodoform packing and methods of its preparation should be standardized.

REFERENCES

- (1) *Furst*: München. med. Wehnschr. 33: 909, 1886.
- (2) *Holm, K.*: Dermat. Wehnschr. 83: 1763, 1926; idem, p. 1796.
- (3) *Cutler, E. G.*: Boston M. & S. J. 115: 73, 1886.
- (4) *Perutz, A.*: Arch. f. Dermat. u. Syph. 154: 206, 1927.
- (5) *Bourdette, A.*: Paris Theses, 1893.

SPECIAL ARTICLE

A REMINISCENCE OF AN EPISODE IN THE HISTORY OF THE SLOANE HOSPITAL*

BY BARTON COOKE HIRST, M.D., F.A.C.S., PHILADELPHIA, PA.

IT IS a great honor to be invited to address the Alumni of the Sloane Hospital for Women, one of the world's centers for the study of gynecology in its modern and correct sense, the study in close correlation of all the conditions peculiar to women. The invitation was welcome to me for another reason. From its earliest beginnings I have had a special interest in this institution, more so than in any of the others in this country, except the one I had the opportunity to found and develop in Philadelphia. It was my fortune besides to be indirectly connected with a critical period of this hospital's history under the mastership of Dr. Cragin, whose friendship and counsel I enjoyed during the greater part of his professional life.

Edward Bradford Cragin's name should always be held in grateful recollection by the Alumni of the Sloane Hospital. His leadership during an important epoch in its development had a far-reaching influence, not only on this hospital but on all the others of its kind in America. Had his action been unwise, his energy misdirected, the progress of gynecology in America might have been retarded, perhaps for a generation.

At the time to which I refer both he and I were striving for the same ends, endeavoring to solve the same problems and encountering the same difficulties. We were in frequent consultation as to the best mode of procedure. His course was admirably chosen. He had the faculty of clear thinking and the ability to express his views lucidly, concisely and convincingly. He was tactful and diplomatic. He had the *suaviter in modo*, supported when occasion demanded it by enough of the *fortiter in re*. With all these qualities, he was the right man to be at the head of the Sloane Maternity Hospital when its affairs demanded such a leader.

My conduct, I fear, suffered in comparison. It certainly was cruder and was never entirely successful in getting the results he obtained with the minimum of friction and in an amazingly short space of time. In looking back at this period the question has come in my mind whether a part of Cragin's success was due to the alert, intelligent, progressive city in which he lived, while I had to butt my head against the ultraconservatism of a community justly famed for its indisposi-

*Address delivered at a meeting of the Sloane Alumni Society, November 1, 1929.

tion to do anything in a hurry. But this is probably a subconscious effort to escape confessing my tactical inferiority.

I have just read, with mingled feelings of pleasure and trepidation, Dr. Williams' charming sketch of the development of the Sloane Hospital, delivered at the last annual meeting of the Alumni Society. It would have been with unmixed pleasure, had I not rashly undertaken to be his successor this evening.

When Dr. Williams presents a subject in his inimitably graceful and thorough manner, he leaves his followers in the uncomfortable position of having nothing left to say. But in his delightful address, for some reason of his own nothing was said of the crisis in the history of the Sloane Hospital to which I have referred. I venture to hope, therefore, that a brief account of this episode in its history might be an acceptable addition to the annals of this hospital.

To understand the situation that developed shortly after Dr. Cragin took charge of the Sloane Maternity Hospital, one must look back a generation or two to conditions of medical practice unfamiliar to the younger members of this body. There is in my mind a picture of two figures in Philadelphia, typical of their contemporaries and immediate predecessors, Elwood Wilson and Albert Smith, he of the Smith-Hodge pessary, both devoting their professional lives to the care of women in childbirth with a good deal of general practice in addition, especially among women and children. They were much alike in their professional attitude and resembled closely in this respect all their fellows. Grave, dignified, with a perfect bedside manner, they were as conventional in their dress, speech and behavior as the most orthodox parson.

Even Dr. Fordyce Barker, who lived in princely style in New York in the early eighties, had something of this professional conventionality about him, although he was a man of the world, accustomed to the best society. His house was a stately mansion reminding one of some of the old London houses of the Victorian era. I have good reason to remember his cordial hospitality, his extreme kindness to a totally unknown and unimportant youngster. The practice of these men was limited to patients in their own homes, necessitating long hours of attendance on each confinement case in a private house. A laborious life with little leisure for study, investigation or research, and none at all for the peripatetic philosophy in medicine advocated by Osler for acquiring a broad knowledge of what is going on in the medical world.

According to our views at present, they should have been capable of dealing with all the anomalies, complications and consequences of the process of generation, necessarily including all the possible diseases of women. But they had no hospital facilities, no hospital training, no surgical experience or ability.

It was in the lifetime of such men as these that there appeared on the medical horizon, you remember, the important discoveries in the

surgical treatment of diseases of women. Conditions in increasing numbers that had never in the whole history of the human race been amenable to any treatment, were found, as you know, to be curable by surgical means. Now the men in this country who had had these conditions under their observation as an integral part of their practice, were pathetically incompetent to keep pace with modern progress and had to stand helplessly aside while others took up the work that should have been theirs.

It was not an easy task for any one, this launching out on an uncharted sea, adopting means of treatment at first looked upon askance by the bulk of the profession and actually denounced by those in the seats of the mighty as subversive of their teaching and practice. Washington Atlee was assailed as an assassin for his ovarian cystectomies. Many of his colleagues refused to meet him in consultation. A famous medical teacher and writer of his day in Philadelphia actually demanded Atlee's arrest during one of his operations. It required, therefore, a special type of man to take up gynecic surgery and to give it a recognized place among legitimate surgical procedures: a pioneer type, bold, aggressive, domineering; a free lance, unfettered by precedent, unsubmissive to constituted authority, with a trace of ruthlessness toward his less progressive fellows; something in him of the old conquistadores.

These pioneers, Ephraim McDowell, Marion Sims, Emmett, Atlee, Spencer Wells, Lawson Tait, Goodell, Joseph Price, and their like, having carried their point, demonstrating the necessity for gynecic surgery in the treatment of many of the diseases of women, instead of the old, futile palliative measures, found themselves in an enviable position. Comparatively few in number, besought by an apparently inexhaustible number of patients for relief not previously obtainable, they were richly rewarded for their services and acquired a brilliant reputation.

There was no field in medicine a generation ago that appeared so alluring to those possessing the qualities essential to success in it, as so-called gynecology. The unjustifiable usurpation of this name for their work, by the way, and of gynecologist for their title was quite characteristic of the men who had taken it up. We now see plainly enough that gynecopathy and gynecic surgery are relatively minor parts of true gynecology, with a steadily diminishing scope, due to the decrease of injuries, displacements and infections as the hospitalization of maternity cases increases. The act of reproduction with all its anomalies, complications and consequences must always be the major subject in a study claiming to include all the conditions peculiar to women. Why not give an appropriate name, then, like gennematology to this major branch of gynecology, to indicate what it really means,

instead of the absurd midwifery, obstetrics, lying-in, Geburtshülfe, accouchement, which have lost their original significance?

Well, the self-styled gynecologists had their way for awhile, creating the impression, not only in the profession but in the minds of the general public also, that they had the sole prescriptive right to the treatment of diseases in women requiring surgical measures.

Now on a stage thus set, with one group of men superintending the act of childbirth and another engaged mainly in patching up its consequences, there appeared a new factor in the scene, the modern maternity hospital, of which there had been a disgraceful deficiency in this country, a hospital equipped for the study, teaching and treatment of the process of generation with all its anomalies, complications and pathologic consequences. The Sloane Maternity Hospital may claim to have been the first of these modern hospitals. It had been preceded by a few others deliberately established for teaching students in addition to their charitable work, but they were small affairs, usually in converted dwelling houses, lacking permanency, without influence on the medical profession at large and practically unnoticed by the general public. William Shippen, Jr., I believe, should have the credit for the first maternity hospital deliberately designed for teaching students the art of delivering women. On January 31, 1765, there appeared in the *Pennsylvania Gazette* the accompanying advertisement.

In 1810 James was conducting demonstrations to a class of students in the Philadelphia Hospital.

Williams gives priority to the hospital established in 1822 by the College of Physicians and Surgeons of Baltimore, as the first to be devoted primarily to the training of students, but as you have heard, Shippen's hospital antedated the Maryland institution by fifty-seven years. It was in the Hospital of the University of Maryland in 1887 that Williams saw one of the two deliveries he witnessed before graduation. He was more fortunate than I. It was two years after I received a medical diploma that I first saw a woman in childbirth and that was in Berlin. The only opportunity I might have had for such an experience I missed while a student in Philadelphia. Albert Smith gave a voluntary course in the out-patient department of the Lying-In Hospital, consisting mainly of didactic lectures but with an occasional assignment to an actual patient in her home. Assigned to such a case I was summoned one night. Answering the call with my head filled with a lot of ill-digested theoretic knowledge and in a dreadful state of panic, I forced myself to mount the front doorstep and pull the doorbell, but before the bell could be answered, what little courage I had left deserted me. I turned tail and ran away.

The Lying-In Hospital of Philadelphia is now in the 103rd year of its continuous existence, the only one of its kind in America, I believe, that can make this claim. For many years inadequately provided with

Doctor S H I P P E N, junior,
HAVING been lately called to the Assistance of a Number of Women in the Country, in difficult Labours, most of which were made so by the unskillful old Women about them; the poor Women have suffered extremely, and their innocent little Ones were entirely destroyed, whose Lives might have been easily saved by proper Management: And being informed of several desperate Cases in the different Neighbourhoods, which had proved fatal to the Mothers as well as their Infants, and were attended with the most painful Circumstances, too dismal to be related! he thought it his Duty immediately to begin his intended Course of Lectures on Midwifery, and has prepared a proper Apparatus for that Purpose, in order to instruct those Women who have had Virtue enough to own their Ignorance, and apply for Instruction, as well as all those young Gentlemen now engaged in the Study of that useful and necessary Branch of Surgery, who are taking Pains to qualify themselves to practise in different Parts of the Country, with Safety and Advantage to their Fellow Creatures.

The Doctor proposes to begin his first Course as soon as a Number of Pupils sufficient to defray the necessary Expence shall apply. A Course will consist of about 20 Lectures, in which he will treat of that Part of Anatomy which is necessary to understand that Branch, explain all Cases in Midwifery, natural, difficult, and preternatural, and give Directions how to treat them with Safety to Mother and Child; describe the Diseases incident to Women and Children in the Month, and direct to proper Remedies; will take Occasion, during the Course, to explain and apply those curious anatomical Plates and Casts of the gravid Uterus at the Hospital, and conclude the whole with necessary Cautions against the dangerous and cruel Use of Instruments.

In order to make the Course more perfect, a convenient Lodging is provided for the Accommodation of a few poor Women, who otherwise might suffer for Want of the common Necessaries on those Occasions, to be under the Care of a sober honest Matron, well acquainted with lying-in Women, employed by the Doctor for that Purpose.

Each Pupil to attend two Courses at least, for which he is to pay Five Guineas. Perpetual Pupils to pay Ten Guineas.

The female Pupils to be taught privately, and assisted at any of their private Labours when necessary.

The Doctor may be spoke with at his House, in Front-street, every Morning, between the Hours of Six and Nine, or at his Office, in Letitia-Court, every Evening.

proper facilities for its work it is now under the superintendence of Drs. Piper and Vaux, housed in as fine a hospital building as can be found anywhere, with ample provision for gynecic surgery.

The Boston Lying-In Hospital incorporated in 1832, after a brief career seems to have lapsed till 1873, when it resumed operations in a converted dwelling, purchased for \$16,000, the trustees having had a disastrous financial experience with a building constructed as a hospital.

A year after the opening of the Sloane Maternity Hospital in 1888, there appeared the small beginnings of a similar institution on the hospital grounds of the University of Pennsylvania. This infant project of mine, designed for a purpose to which the country was not accustomed, after a lapse of many years since such a place had first been established, had at the start a stormy struggle for existence. We had to contend with an almost insane prejudice and animosity in many people, a state of mind strangely out of accord with the end of the nineteenth century. We look back on it as one of the evidences of a provincial ignorance, cropping up here and there in the United States, that has been, and, to a lesser degree, still is, a blot developed here on the civilization transplanted from Europe to this continent, a sign of sporadic decadence, bred in our isolation from the original source of all our culture, of which we can recall many examples in our political and social life.

In a report from the Sloane Hospital some years after its foundation, there appears a statement that the original building, three stories high, accommodating only twenty-eight patients, was the greatest plant for obstetrics in the world, a declaration worthy of Mr. Jefferson Brick, a revelation of the provincial mind with the braggadocio often accompanying it. I remember distinctly a member of the staff of the Philadelphia Hospital being immediately discharged for daring to exhibit a forceps operation to a class of medical students, although the patient was anesthetized and unconscious of the exposure, and it was not more than twenty-five years ago that a woman, prominent socially in Philadelphia, told one of the University trustees that she had organized a committee of women to set fire to the University Maternity Hospital. This feeling, while it seems to us now an ignorant prejudice, worthy of the Middle Ages, was not altogether unreasonable. At least we must make allowances for it. It was an inherited prejudice coming down through countless generations from an age in which it was punishable by death for a man to intrude on the privacy of a parturient woman. It would be well for us to remember this.

The same feeling lies dormant in the female brain today and might be awakened by sufficient cause. It is not likely that this country will ever have the callousness about this matter that is seen in some of the

large hospitals of Continental Europe, but a word of caution to the younger assistants and house officers is not out of place.

In developing the modern maternity hospital we had to face another, a more insidious, a more serious opposition than the prejudice of women against the undue exposure of their sex. In the rise of the new maternity hospital the gynecopathists of the country immediately sensed a danger to their profitable monopoly of a lucrative branch of gynecology. They saw plainly that, as in Europe, these hospitals would command the clinical material to which they claimed an exclusive right and that consequently their narrow specialty was doomed eventually to extinction. They were also aware that the kind of physician required for the head of these new institutions must have a training fitting him to do all that they did and a great deal more, and would not be the sort of person supinely to submit to a deprivation of work that was legitimately his or to be thrust aside into a position of inferiority. Hence, there arose an effort to suppress the heads of these new hospitals and to restrict their work by methods that, to put it mildly, were not commendable. They savored indeed of the bitterness always engendered by an attack on intrenched special privilege, or an attempt to overturn an established order.

Cragin was forbidden to do any surgery in the Sloane Maternity Hospital. He was not even allowed to do a secondary perineorrhaphy, although the original injury had occurred in his hospital.

At a meeting of the medical faculty of the University of Pennsylvania at which I was present, a resolution was adopted forbidding me to operate on any condition in the new maternity hospital, except on one that had arisen in the patient while she was a resident in the hospital, and you remember the acrimonious dispute between Williams and Kelly of Baltimore as to who should repair a complete laceration of the perineum that had occurred in Williams' service. Thus the immediate successors of the men who at first had been subjected to the most violent abuse and the most determined efforts to suppress them, in their turn tried to stifle their presumptive rivals. One is reminded of the Puritans after their arrival in Boston. Just escaped from religious persecution themselves at home, they cropped the ears of the Quakers or hung them for trespassing on their theologic preserves. The *odium theologicum* we agree is the worst hate of all, but there have been periods of medical history in which the *odium medicum* was almost as bad.

The edict addressed to me by the medical faculty was ignored. The maternity hospital continued as before to have a very active gynecic surgical service with long operative clinics three times a week, exhibiting mainly all the possible pathologic consequences and complications of pregnancy and labor, immediate and remote, surely a legitimate

part of such an institution's work, but incidentally embracing gynecology in its entirety.

A few years later the same resolution was adopted again by the medical faculty and again met with the same response. How Cragin met and defeated the envious attempt to restrict his work I never exactly knew. One of the moves of his diplomatic campaign was to invite me to New York to read a paper on the equipment and scope of the modern maternity hospital, which he told me later he had shown to Dr. Butler and the trustees of Columbia. The next thing we knew, a few years later, Cragin had an addition to the Sloane Maternity Hospital for dealing with all the diseases of women, and we found him in the enviable position of master of the Sloane Hospital for Women with no rumblings of protest or opposition that we at least had heard at a little distance. An invitation was sent me to attend the formal opening of the new hospital with its recent addition. It was difficult, I confess, to conceal the envy I felt at what I saw.

My affairs were obviously not so diplomatically managed, for to the end of my incumbency as a teacher of the undergraduate students, I had constantly to resist the persistent attempts to limit my teaching and practice. As a member now of the Faculty of the Graduate School of the University of Pennsylvania and of the Staff of the Graduate Hospital, which is organized on modern lines, my difficulties are ended.

These stormy days of the past are now over for all of us. With the exception of one or two reactionary places, the principles embodied in your institution are generally accepted throughout America, as they have been for a much longer time in Europe. You of the younger generation, with your feet planted firmly on the solid earth, can look back with equanimity, and I hope a little sympathy, at your predecessors struggling in a tempestuous sea. It is plain sailing in the future for you.

Naturally progress will not cease. Changes are to come but nothing, I think, as revolutionary as in the recent past. There is ample room for further development in enlarged hospitals with a much greater capacity, in implanting in the public mind an appreciation of the great advantages of the hospitalization of all maternity cases, in improved technic and equipment, in closer cooperation with all the other branches of medicine, in provision for laboratory and clinical research and for animal experimentation.

Under the able leadership of the present master, the country at large, and especially those of us who have watched with admiration this hospital's growth from its beginning to its present imposing position, will confidently expect the Sloane Hospital for Women to remain a bulwark against reaction, a stronghold for the continued evolution of true gynecology. We will look to it for further contributions to our stock of knowledge, like Cragin's demonstration of what can be done

by the conservative treatment of placenta previa, the studies in Studdiford's time of the injuries of the fetus in head-last labors and their prevention.

There is one thing I have always had much at heart, which I attempted once to accomplish, to which I beg to call the attention of my friend, Dr. Watson. It seems to me that the time has come to bring about a closer cooperation between the important hospitals for women in Canada and the United States. In travelling about the country to visit these institutions, one is impressed with the lack of unanimity of opinion as to the best way to utilize their resources and a lack of uniformity in practice as to the best methods of teaching. No one would advocate too rigid a standardization, but would not the conditions in this respect seen in Germany, Austria, Switzerland and Scandinavia be preferable to our exaggerated individualism, which obstructs the development of a national school of gynecology here?

If I am right in advocating an association of special hospitals for women, with frequent conferences of their executives, both lay and professional, which should raise the average level of them all, the Sloane Hospital for Women, the first specially constructed and adequately equipped woman's hospital, is well fitted to take the lead in such a movement. Whatever may be done in this and in other matters to further our advance in one of the three great divisions of medicine, we may congratulate ourselves on the outlook. If we consider what has been accomplished in a single generation, the future looks bright indeed if anything like the same rate of progress continues. To paraphrase a boast of old chauvinistic England, much chastened in this respect of recent years, we have the men, we have the hospitals and we have the money too. With all our advantages, it will be much to our discredit if, in the near future, we do not make our hospitals for women the models for the rest of the world to copy.

1821 SPRUCE STREET.

Society Transactions

NEW YORK OBSTETRICAL SOCIETY

MEETING OF NOVEMBER 12, 1929

DR. R. A. HURD read a paper entitled **Observations and Conclusions on Plastic Operations at the Woman's Hospital.** (For original article see page 633.)

DISCUSSION

DR. GEORGE G. WARD.—Perhaps we are to be congratulated at the Woman's Hospital in the fact that we have four gynecologic divisions there, each in charge of a surgeon with his assistants, and each man entirely free to work in his own way and to solve the problems that come to him as he seems to think best. I believe that is the only right way to make progress, because a man will get one point from one surgeon, another point from another and so on. Probably no one surgeon is 100 per cent accurate in his work. Therefore, Dr. Hurd has had the opportunity in the Woman's Hospital to study the various methods used in the different divisions which vary one from the other in the way they handle these problems. Of course, it must always be remembered that there are "many roads leading to Rome," and most of them get there, so that one man may succeed perhaps with one method and another man may also succeed with a method that may differ.

The operation that Dr. Hurd emphasized for cystocele is practically the principle laid down by Hadra of Texas many years ago, and which was described by Dr. Noble in Kelly and Noble's work on Gynecology. It was Hadra who first advocated the loosening of the bladder and shifting it higher up, in the identical way that Dr. Hurd has described, and the suturing of the anterior vaginal wall through its entire thickness was done by Noble and by men following that technic.

I think one of the most valuable things that Dr. Hurd brought out is the method of approach, which Dr. Byron Goffe has stressed, first on the posterior vaginal wall, of getting into the line of cleavage by going *above* the fusion point which is at the perineum on the pelvic floor. The same applies to the anterior vaginal wall, not attempting to enter the line of cleavage too near the external os where there is a fusion of tissues and difficulty in getting into the cleavage plane. Likewise by not attempting to get in near the urethra a point which has been recognized by many plastic surgeons before. In some of my own work many years ago, on vesicovaginal fistula of the inaccessible type, the principal thing I brought out in the paper that I presented at that time was that in attempting to do a flap operation for vesicovaginal fistula you should get the line of cleavage a long way from where the fistula was, down in the part of the vagina free from scar tissue, and that when you once get into the line of cleavage you work your way up, practically in the same manner that Dr. Hurd has emphasized, by getting into the anterior wall and getting into the fascial plane above the endofascial structures. That is the most important thing he has brought out in his paper in my opinion, and certainly for those not experienced in plastic work it will be a very great aid in helping them to learn how to separate these structures without damage.

DR. DOUGAL BISSELL.—The points in this discussion which really interest me are not those pertaining to priority with respect to particular steps in the perfection

of the varied operations under consideration but those pertaining to the pathology, etiology and surgical technic.

Before pathologic anatomy can be understood, normal anatomy must be understood; the same may be said of etiology and surgical repair.

The normal relationship between the inferior muscle wall of the bladder and the anterior or superior muscle wall of the vagina is of vital importance. If this area is dissected under normal conditions, it will be found that it is difficult to determine the line of demarcation except near the cervix, where the bladder, vaginal wall and cervix meet. In this area only is there normally a somewhat loose connection. If one dissects this region expecting to isolate a distinct fascial layer between these organs, such a layer as can be used independently for reconstruction purposes, he will be disappointed. The fixed points of the intraabdominal fascia, a fascia which gives support and stability to all of the abdominal and pelvic organs, are first, the thoracic diaphragm above, the umbilicus in front, the entire spinal column behind and the white line on each lateral wall of the pelvis. From the white lines on the pelvis the fascia disperses through the pelvic tissues, and that portion known as the vesical portion is not an independent fascial layer but ramifies into many thin divisions forming cellular covering for the blood vessels, nerves and muscle tissue, and are recognizable only through the microscope.

The degree of cystocele, in my opinion, depends chiefly upon the extent of the injury to the tissues between the vesical and vaginal muscle walls resulting in the loss of intimate relationship between these muscle layers. If this theory be correct, the pathology of a cystocele centers on the line of demarcation between the two muscle walls; and the first point of interest in the technic of surgical repair is the method of approach to this injured area. The common method of approach is by a longitudinal incision through the anterior vaginal wall from a point near the base of the urethra to a point near the junction of the vaginal wall and the cervix. It not infrequently happens that the anterior vaginal wall is greatly hypertrophied when a cystocele exists. Under these circumstances the operator may find it difficult, when using the longitudinal incision, to determine the line of cleavage between the bladder and vaginal wall and will follow artificial lines of dissection in the thickened tissue. In the technic I have developed for the cure of cystocele, I reach the line of cleavage between the bladder and vagina through a transverse incision of the anterior vaginal wall at a point near the junction of the anterior wall and the cervix; here, as I have said, is found normally a somewhat loose connection, and when injury occurs resulting in a cystocele, the looseness is increased, and if this point is used for the initial incision we will find in cutting through the entire vaginal wall a definite and enlarged space beyond with more or less loose connective tissue.

The anterior vaginal wall is grasped in its middle line near its juncture with the cervix by two Allis clamps placed longitudinally and half an inch apart; then with scissors a deep incision is made through a tent-like fold of the lifted vaginal wall, and when the scissors pass completely through the wall, a bloodless space is entered. The limits of this space usually take on a glistening appearance and at times make one think he has entered the peritoneal cavity. From this point on, the separation of the bladder from the vaginal wall is easily followed in every direction.

Since 1917, when I first became interested in this work, four pathologists made numerous studies for me of the microscopic structure of the excised portions of the anterior vaginal wall (the same statement is applicable to the posterior vaginal wall), and in no instance were they able to define a layer of fascial tissue. It is, therefore, my conviction that we are in error if we teach that there is a definite

fascial layer which can be isolated and utilized for surgical repair, and further that the term fascial-lapping as applied to reparative work on the vaginal wall is a misnomer.

DR. REGINALD M. RAWLS.—It seems to me that the crux of the whole matter is the plane of cleavage. The cleavage plane was first demonstrated in the Woman's Hospital by J. Marion Sims in a very difficult cystocele. This required a more serious operation than had been contemplated, and Sims had to obtain permission of the Board of Governors, because his idea was that to cure the cystocele he would make a large vesicovaginal fistula. He felt sure he could cure the vesicovaginal fistula but was not so sure of the cystocele. He then cut out the herniated bladder as he thought and devised some large phimosis clamps for the purpose. His idea was that he would thus control the bleeding of the bladder when he dissected out or cut off the portion of the bladder. He pulled the cystocele through the phimosis clamps and cut it off. He took off the clamps and saw that he had not made a vesicovaginal fistula but had entered the cleavage plane. That was the beginning of the cystocele operation because the bladder had retracted back, and he had the denuded edge of the vaginal wall on either side, which he brought together with sutures. So we can even go back beyond Hadra's time. Hadra's principal contribution to cystocele was the elevation of the bladder and the fixation of the descended bladder on a high level. This, as Dr. Ward says, was afterward taken up by Noble. So I feel the crux of the whole matter is to get the cleavage plane. Dr. Bissell entered it one way. I previously had entered it for the cystocele operation by an incision from the urethra to the cervix, but at the same time it seemed wise to me to cut through the whole vaginal wall and demonstrate the bladder, which I could push off and be sure I was in the cleavage plane.

I would like to differ with Dr. Bissell and still further modify it and call it a lapping of the contents of the anterior vaginal wall, because, unquestionably, when we come to this cleavage plane we expose a thin intracellular fascial layer that was so well demonstrated by Dr. Hurd. Therefore, if I should ever be tempted to write again on cystocele, I would like to make a modification of not lapping the fascia independently of the anterior wall, because I feel sure that I never have done that but have always lapped the contents of the anterior vaginal wall for cystocele.

DR. BENJAMIN P. WATSON.—Dr. Hurd has given an excellent description of the anatomy of the pelvic structures, and especially of the anatomy of the pelvic fascia, but why he should then deny that there is any fascia I do not know, because that is what it amounts to. Whether we call this fascial layer by one name or another is mere quibbling. You can separate a distinct layer of tissue in cystocele with a definite line of cleavage between the anterior vaginal wall and the bladder and trace it very definitely up to the back of the pubis and down to the cervix, the pubocervical layer, which contains fibrous tissue, elastic tissue, and a considerable amount of nonstriated muscle tissue. I, personally, have always made use of that layer—call it fascia or whatever else you like—in the repair of cystocele, for two reasons, first, because when the bladder is pushed well up off the supravaginal cervix and into position, if that layer is separated you can get it well over the bladder with less tension than if you take in the whole thickness of the vaginal wall. The second reason for using it is that at least 50 per cent of the cases of cystocele have incontinence of urine, and by lapping that fascia around the neck of the bladder one can, in my experience, cure 90 per cent of those cases. I do not think you can get anything like that proportion of cures if you depend on the thickness of the vaginal wall to get that bracing of the neck of the bladder up behind the symphysis pubis which is the essential thing in the operation.

Dr. Hurd stated that he thought the Kelly operation was the best for these cases of incontinence. I have found that operation inadequate. My idea of the incon-

tinence of urine in those cases is that this fascial layer has so given way that the neck of the bladder, with the sphincter, is no longer braced up at the back of the pubis. The sphincter has no longer a fixed point from which to act. If you can restore the neck of the bladder to that fixed point behind the pubis, the patient will have continence. How that can be done by taking the whole thickness of the bladder wall I do not see. At any rate, it cannot be so well done as when the fascia is separated and then brought over.

DR. WILLIAM A. JEWETT.—The question at issue as to whether one is dealing with fascia or muscle makes very little difference. We have in the anterior wall definite structures that are supporting which can be brought together under the bladder separately from the mucous surface, and I believe that sometimes this supporting structure is lacerated transversely and sometimes it is lacerated anteroposteriorly. I recall that the late Dr. Watkins claimed that in a large number of the injuries of the anterior wall the split in this supporting plane was a transverse split. He therefore closed it transversely because he believed that this resulted in restoring of the structures to the position they had previously occupied. Most of us do the operation as has been described by bringing the supporting structures together from side to side and then closing over the mucosa.

DR. SAMUEL H. GEIST.—We have recently been utilizing a rather old and possibly more or less forgotten method at Mt. Sinai Hospital for a very select group of patients with a moderate or large cystocele who have to have some intra-abdominal surgery done, such as a hysterectomy, a myomectomy, or removal of any intraabdominal tumor. In such cases after the intraabdominal operation is completed, we have been fearful that the pull on the cervix necessary for carrying out the plastic operation might jeopardize the sutures or ligatures that have already been placed in the abdomen. On the other hand, we have felt that if the vaginal work is done first, the intrauterine manipulation might jeopardize the security of the vaginal sutures, so that we have selected in such cases the Polk operation, which is done after the necessary intraabdominal procedures have been completed, by stripping back the bladder, as one would do for a complete hysterectomy, and uniting the pubocervical fascia with interrupted chromic catgut sutures, tying the lower suture first and including the cervix in the uppermost one or two sutures. Usually four sutures can be used.

We have had 14 cases done by this method and which have been followed six, eight, and some perhaps ten months. While some of them have not been satisfactory, I think the proportion of successes thus far compares favorably with the approach from below, and this method obviates a possible source of danger in doing the operation by the combined abdominal and vaginal route.

OBSTETRICAL SOCIETY OF PHILADELPHIA

STATED MEETING, OCTOBER 3, 1929

DR. W. F. HARRIMAN exhibited a **Bipolar Electrode for Application to the Cervix Uteri**, which was devised by Dr. F. M. Ende of New York and described in the July, 1929, issue of this Journal. Dr. Harriman commended the procedure and stated it had given him good results, without complications.

DR. MARGARET C. STURGIS presented a paper entitled **The End-Results in Ten Cases of Hydatidiform Mole Treated by Curettage**. (For original article see page 641.)

DISCUSSION

DR. BROOKE M. ANSPACH.—There are two cases of this condition that stand out prominently in my memory. In one the patient had pernicious vomiting. A therapeutic abortion was necessary. In an examination under anesthesia (the patient was difficult to examine otherwise), I found the left ovary enlarged to the size of an orange, adherent in Douglas' pouch. After opening the abdomen I did a hysterotomy and to my surprise there was an hydatidiform mole. The uterine wall was entirely healthy. I cleaned the uterine cavity thoroughly with my finger and gauze and closed the incision. The right ovary was enlarged as much as the left but lay well above the pelvic brim. I removed the left ovary which was torn in releasing it from the pelvis. Two months later the patient started with irregular bleeding and then there slowly developed in the anterior wall of the uterus on the right side a definitely palpable tumor. A diagnosis of chorionepithelioma was made, based on the development of the uterine tumor and the recovery by diagnostic curettage of proliferating chorion cells from the uterine interior. A complete hysterectomy was done. At that time the ovary on the right side had shrunk to a size below the average ovary.

In the other case the patient had passed an hydatidiform mole and then kept on bleeding. An examination of the scrapings showed cells that suggested a tendency to malignant change.

In order to prevent the development of chorionepithelioma, we used 50 milligrams of radium inside the uterus for twelve hours. There were no further symptoms and two years later the patient gave birth to a normal full-time child, who has subsequently grown to healthy manhood. Four or five years ago the patient developed a myoma of the fundus for which a supravaginal hysterectomy was done.

DR. WELDEN.—In the last five years I have encountered five cases. Two of them were about three months' pregnant, and the growth had been very extreme. I noticed in all my cases the markedly toxic condition of the patient and the rapid and extreme loss of weight. One patient had gone down from 150 to 95 pounds with a three months' mole, but within four months after I had curetted, she had regained all she had lost. This woman was the only one who became pregnant and she had a baby with a large spina bifida. All of them made absolute recoveries.

As to the symptoms, two of them I diagnosed by loss of weight and toxic condition, without the usual findings of the laboratory, but they all complained of an extreme internal pressure pain of a bursting type, rather than the ordinary pain of pregnancy.

DR. DANIEL LONGAKER.—In an experience of six cases the following points have impressed themselves on my mind: first, difficulty of diagnosis; second, the frequency of vomiting and evidences of toxemia.

I have made it a uniform practice to do an immediate curettage and follow this up with a subsequent curettage a month later. The scrapings are carefully studied microscopically.

The most recent case looked very suspiciously like a chorionepithelioma at this second curettage, but as nothing had been said to the family about the possible necessity of a radical operation like hysterectomy, we limited ourselves to the removal of a section of the posterior lip of the cervix and scraping of the involved posterior vaginal wall, with deep cauterization of the involved area with the galvanocautery. The microscopic study showed the invasion was not a chorionepithelioma.

In my own experience no case of chorionepithelioma developed.

DR. J. STUART LAWRENCE.—It may interest Dr. Sturgis to know the St. Mary's experience. In about 2000 cases, we have had four hydatidiform moles. None of these was diagnosed absolutely. Two of the cases were unusual, in that they occurred in one individual, and in between the attacks there was a normal pregnancy.

All four of the patients are alive, and have not been followed by chorion-epithelioma.

DR. STEPHEN E. TRACY.—Three cases of hydatidiform mole have come under my observation. One patient was referred to the hospital as a case of marked toxemia of pregnancy. One morning, two or three days after admission, there gushed from the uterus a large quantity of dark blood. The uterus was explored and a hydatidiform mole was found and removed. The toxemia cleared up promptly and the patient was discharged from the hospital in good condition. About two months later she returned to the hospital because of uterine bleeding. A diagnostic curettement was performed. The material from the uterus was examined histologically, and the pathologist reported the lesion to be chorionepithelioma. The slides were submitted to an expert gynecologic pathologist who agreed with the diagnosis and requested that he be given one-half of the uterus when it was removed. It was recommended that the patient have a complete hysterectomy. The family physician did not approve of such a procedure and the mother of the patient agreed with him. The doctor stated that he would keep the patient under close observation, and give her local treatments. The patient was seen a few months ago, more than fifteen years after the diagnosis of chorionepithelioma was made and she was enjoying excellent health.

DR. WILLIAM R. NICHOLSON.—I have felt that Dr. Schumann's work which has been mentioned was too radical, at least as far as my experience has gone. I have never seen a chorionepithelioma following a hydatidiform mole. I have seen some few cases of the latter in the last twenty years but had only one chorionepithelioma, which followed an ordinary miscarriage. I think Dr. Tracy's remarks in the discussion should be accentuated. I, too, have had the experience of submitting tissue to an extremely well-trained pathologist and receiving the report of chorionepithelioma, but the subsequent course of the case proved that the diagnosis was mistaken. It is not easy to make this pathologic diagnosis in all cases and the pathologist feels his responsibility very greatly and for this reason there is a tendency to report malignancy in cases which at least are doubtful from the pathologic side. This should be borne in mind by the clinician in interpreting the reports made from the laboratory.

DR. GEORGE W. OUTERBRIDGE.—In line with what Dr. Tracy said, I have never forgotten a case which I saw many years ago while working in the laboratory of Gynecological Pathology at the University with Dr. C. C. Norris. This was a uterus, not merely curettings, in which we found an extensive invasion of syncytial wandering cells throughout the musculature. There was some doubt in the minds of Dr. Norris and myself as to the presence or absence of malignancy, and we agreed to send sections to three pathologists for their opinions. We received three different answers: one was to the effect that the case was unquestionably benign, the second, that it was unquestionably malignant, and the third, that it was quite impossible to say.

DR. CHARLES MAZER.—The only case of chorionepithelioma I have seen followed an abortion. Thirteen follow-up cases of hydatidiform mole, treated at the Mount Sinai Hospital during the past twelve years, are well. One of these cases developed two huge theca lutein cysts which produced pressure symptoms to an extent requiring removal.

DR. JOHN M. LAFERTY read a paper entitled **A Test of Labor**. (For original article see page 647.)

The discussion was participated in by Drs. Lawrance, Boyd, Longaker, Hanna, and Nicholson.

BROOKLYN GYNECOLOGICAL SOCIETY

MEETING OF NOVEMBER 1, 1929

DR. J. P. GREENHILL, of Chicago, Ill., read a paper (by invitation) entitled **An Analysis of 874 Cervical Cesarean Sections Performed at the Chicago Lying-In Hospital**. (For original article see page 613.)

DISCUSSION

DR. CHARLES A. GORDON.—Cesarean section apparently is considerably on the increase in Chicago. It was my impression that the great wave of enthusiasm for cesarean section was waning. Apparently not. In the total admissions from one large clinic in Chicago the incidence is very much larger than that in our Brooklyn hospitals and possibly New York.

Not so long ago our Society analyzed 1805 cases of cesarean section over a five-year period from thirty-four hospitals. Dr. Greenhill has presented a series of 874 for ten years from one hospital, it is true, with an incidence that has steadily risen until it was 3 per cent for the last year. In my experience with services covering something over 2000 cases yearly the incidence was 1-140 as against his 1-33. We might possibly do 10 or 12 cases a year—our numbers could never possibly run into the hundreds. After examining the indications given this evening, one could hardly quarrel with the speaker, yet it seems to me that section at six, seven and a half, or eight months would certainly seem an indication to be questioned.

The indications for eclampsia do not concern us here, because in the eclamptic, preeclamptic and nephritic toxemias our treatment is different. In our clinics we do not handle our progressively increasing toxemias by cesarean section or by any other operative method, certainly not the nephritic toxemias, so readily and so quickly as it seems is done in Chicago.

The development of the operation in the lower field, however, is a great contribution to obstetrics, and we owe much to Dr. Greenhill and Dr. DeLee for the development of the technic, and for showing us the great value of the lower segment operation as compared to the other. In the series of cases that we analyzed you will remember that the lower segment operation stood up very well. In the cases in which it was done the group was an entirely different one from that which the doctor has presented here. In his entire clinic the operation was one of choice. In the cases that we analyzed it was done only in the most serious cases and the morbidity and the mortality were better than in the classical section.

DR. THURSTON S. WELTON.—This operation was in reality made popular by Dr. Beck of this city. There is a tendency throughout the country to give it a high-sounding technical name and to forget that Dr. Beck had anything to do with it. He never claimed he originated the low section operation, made it up, or changed it, or anything else. Up to 1918 fully half of the cesarean sections were the old type of section. Dr. Beck put life into this low section operation and made it popular in Brooklyn, where it is now widely employed.

DR. GREENHILL (closing).—First, the question as to what objection I personally have to spinal anesthesia. I believe that direct novocaine infiltration is safer, and it is for that reason we prefer it. The results are as good.

The analysis that Dr. Gordon and his committee made was an excellent piece of

work and much more difficult than mine. Our incidence of 1-33 as against 1-140 is correct.

Then, of course, our attitude is that we prefer cesarean section to high forceps, especially in patients in whom we look forward to difficult deliveries. Many others would not. Our reasons are these: a clean hospital, so that we are not afraid; plus the technic, which we think is good; and our results, which seem to show that we are doing fairly good work, and we do more perhaps than the average individual in other hospitals.

Dr. Gordon mentioned the patient who was six or seven months pregnant; I agree with him. I did not like to say cesarean there at the sixth or seventh month of pregnancy. It is nothing but a hysterotomy. That was a case of psychosis where the neurologist said, "Terminate the pregnancy," and it was done. The two other cases I do not know about. I think they were toxemias. In Brooklyn and elsewhere the treatment of toxemia is conservative. Paradoxical as it may seem, I agree with that. Three years ago I read a paper wherein I reported our cases of eclampsia, 78 in all, and 75 per cent of them were delivered by section or other methods. Our total maternal mortality, not excluding anything, was 7.7 per cent. That is as good as any one has reported in this country under any form of treatment, as far as I am aware. Eighteen and one-half per cent of our patients had cesarean section. The others were delivered through the vagina by the means safest for the mother—rupture of the membranes, bag to start labor, pack, etc. The convalescence was satisfactory in 80 per cent of the cases after the babies were delivered.

In our hospital we empty the uterus for toxemia. I believe, however, for the general practitioner in the home or in a hospital that is not clean, or if he has not enough obstetric skill, the best thing to do is to leave the patient alone; give her some morphine or magnesium sulphate and nothing else. I think that if most mothers treated at home were put on a mattress on the floor the results would be better than by any other method.

Dr. Beck deserves great credit for what he did.

CENTRAL ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

Inaugural Meeting, St. Louis, Mo., October 20, 1929

DR. RICHARD PADDOCK, ST. LOUIS, presented a paper on **Clinical Follow-up in Placental Syphilis.**

The study was undertaken to check the accuracy of the histologic diagnosis of syphilis of the placenta. Group I includes 64 cases where a definite diagnosis could be made, while Group II comprises 72 doubtful cases.

The maternal blood Wassermann reaction showed the following correlations:

Group I, positive	48	Group II, positive	37
negative	16	negative	31
	<u>64</u>	no record	4
			<u>72</u>

THE CHILDREN OF MOTHERS IN GROUP I

<i>With maternal blood Wassermann positive</i>		<i>Maternal blood Wassermann negative</i>	
Premature, stillborn	23	Premature, stillborn	5
Miscarriages	13	Miscarriages	6
Premature, alive (4 died later)	6	Abortions	2
Full term, alive (1 died, 4 mo.)	6	Live-born (1 died later)	3
	<u>48</u>		<u>16</u>

THE CHILDREN OF MOTHERS IN GROUP II

<i>Maternal Wassermann positive</i>		<i>Maternal Wassermann negative</i>	
Premature, stillborn	13	Premature, stillborn	14
Miscarriages	1	Miscarriages	8
Abortion	1	Abortion	1
Premature, alive	5	Premature, alive	2
Full term, alive (3 showed clinical syphilis later)	17	Full term, alive	6
	<u>37</u>		<u>31</u>

Of the four mothers in Group II with no recorded Wassermann reaction, 2 had miscarriages, and 2 delivered full-term, living children.

These data indicate that a definite diagnosis of placental syphilis is usually associated with a marked fetal involvement. When the lesion is not so well defined, marked fetal changes are less common.

When the placenta shows evidence of syphilis, the mother and child should be followed up to determine the advisability of instituting antisyphilitic treatment.

DISCUSSION

DR. C. E. GALLOWAY.—Doctor Paddock found only a small number of positive Wassermann reactions (85) out of his total cases showing syphilitic placentas (136). Up to now my practice has been to obtain a blood Wassermann reaction on every patient and to institute treatment at once if it is positive, believing that early treatment is most desirable. In view of the high incidence of syphilitic placentas among patients with miscarriages, it might be advisable to give antisyphilitic treatment to those with a history of previous miscarriage even though there is no serologic evidence of the disease at the time.

DR. F. H. FALLS.—It should be emphasized that a patient may have syphilis and still have a negative Wassermann reaction, a fact which is brought out in Doctor Paddock's figures. When examination of the placenta first draws attention to the disease, both the mother and the child should be given antisyphilitic treatment in adequate courses. In my own Department, such cases are referred to the Visiting Nurse, who sees to it that they return for treatment.

It is not easy to diagnose syphilis from the gross placentas. Many times the placenta which looks syphilitic to the eye, is shown to be negative microscopically, and vice versa.

DR. PADDOCK (closing).—Each placenta is cut in thin slices and examined grossly, typical areas being taken for histologic study. The hematoxylin eosin stain is commonly employed. In certain instances silver stains have been used, but I have never been able to say that I have found undoubted spirochetes.

Cases were placed in the doubtful group whenever it seemed that there might be any disagreement about the diagnosis. Obviously, there is opportunity for different interpretations of the observed variations from what is strictly normal.

The percentage of living children, discharged from the service two weeks to four months after birth, was 29.5 per cent.

DR. FRED L. ADAIR, CHICAGO, ILL., described a **Method for the Study of Fetal Positions.**

The findings corroborate the generally accepted ideas regarding fetal positions, but demonstrate that there is considerable variation in the relative location of the head, body, and extremities in fetuses in the same positions.

X-ray films of women at term or early in labor were taken and the fetal skeletons were outlined on superimposed paper. These fetal outlines were then drawn as a conglomerate picture, relationships of the fetal parts to the maternal structures being faithfully preserved. Drawings of the various fetal positions were prepared, as representative of the different types, the dominant attitude and position being graphically shown and variations being pictured. For the more common positions, the drawings were more accurate than for the more unusual positions, where fewer roentgenograms were available.

DR. HUGO EHRENFEST.—The most interesting thing is that this work demonstrates beautifully the correctness of prevailing conception as to position of the fetus in utero, which we long since developed as a result of abdominal palpation.

DR. ADAIR (closing).—The sole purpose of this work was to prove or disprove our present ideas about fetal positions. A sufficient number of the more usual positions has been studied to make it reasonably certain that these ideas are essentially correct, but more observations will be needed to establish the correctness of our conceptions regarding the more uncommon positions.

The same patient was not exposed more than once, and that should not be harmful.

DR. OTTO H. SCHWARZ, ST. LOUIS, presented a case report of **Cortical Necrosis of the Kidney in Pregnancy.**

This patient was a negress, aged twenty-two years, a primigravida, due on September 5, 1929. She was first seen on July 9 with a blood pressure of 132/78 and with no albumin in the urine. The blood pressure rose rapidly to 180 on July 19, and large quantities of albumin appeared in the urine together with granular casts. There was an oliguria in spite of the intravenous administration of glucose. Premature delivery occurred on July 21, after which the blood pressure remained high and the oliguria persisted. The blood nonprotein nitrogen, which was normal before delivery, rose to about 100 mg. per 100 c.c. The patient's condition became worse until the time of her death.

At autopsy the kidneys were small and contracted, with the cortex not more than 2 mm. thick and markedly necrotic so that not more than two-thirds of the cells were functioning. There was evidence of previous glomeruli damage and sclerotic changes in the vessels. Endarteritis was evident microscopically and recent thrombi were seen in many of these vessels.

Such a cortical necrosis of the kidney is extremely rare with only three cases in the American literature and only twenty in the world literature. The most extensive discussion of this subject is that by Cruickshank, of Glasgow, who reviews the previous work of Jardine and Teacher.

DISCUSSION

DR. JAMES R. MANLEY.—I have seen one patient with a lipoid necrosis which was more extensive than in Doctor Schwarz's case. She was a primipara, thirty-eight years old, who when eight months pregnant was seized with abdominal pain. Thirteen days previously examination had shown the pregnancy progressing normally but on admission to the hospital she was very ill, with a pulse of 130. The abdomen was tense, and the uterus was hard and sensitive. The mucous membranes were pale but there was no vaginal bleeding. The white count was 20,000, and the hemoglobin 50 per cent, while the urine contained 4-plus albumin. A classical cesarean section was done at once, the uterus being found full of blood, the placenta separated, and the child dead.

The patient lived for twelve days, during which time there was a total output of only 810 c.c. of urine, which contained considerable albumin and a large amount of pus. Four days after operation the blood creatinin was 4.5 mg., but shortly before death it rose to 12.5 mg., and the urea nitrogen increased to 75 mg. There were never any convulsions, and never more than a slight edema. On the third postpartum day she was seized with a watery diarrhea, eight to ten stools each day, which persisted until death. Blood transfusions were given without beneficial effect.

Postmortem examination showed that the uterine condition was satisfactory, with no leakage through the incision. The kidney damage was very similar to that demonstrated by Doctor Schwarz, but was much more extensive. Scarcely any functioning kidney tissue was found.

DR. J. W. HARRIS.—In a study made several years ago we were impressed by the difficulty in deciding which patients with toxemia of late pregnancy had suffered permanent damage to the kidney tubules. It was surprising to find that many of our mild cases showed such permanent alterations. We came to feel that these nephritic changes probably were the result of the prolonged toxemic disturbance rather than the cause of the toxic symptoms.

DR. SCHWARZ (closing).—The liver in this patient showed no evidence of the ordinary changes due to the toxemia of pregnancy. There was a marked hepatic edema, but no peripheral necrosis.

DR. E. D. PLASS, IOWA CITY, IOWA, described the Leucocyte Variations in Normal Obstetric Patients.

There is a physiologic leucocytosis in the latter part of pregnancy, especially in primiparas, with a further rise of the leucocyte count during labor, when the total count may mount considerably higher depending in part upon the length of labor. Following delivery the white cells tend to increase during the first two to six hours and then fall rapidly to normal in a few days. The labor leucocytosis may be attributed to muscle exertion, but no adequate explanation of the postpartum rise has been offered, since it is not actually proportional to the severity of the labor nor to the loss of blood. The leucocytosis is polymorphonuclear in character with a relative and even an actual diminution of the lymphocytes, and mononuclears, and often a disappearance of the basophiles and eosinophiles.

Diurnal variations, sometimes occurring within a few minutes, may change the count as much as 4,000 or 5,000. Exercise seems to cause an increase, and nursing a diminution. At the time of a chill, a leucopenia with a count down to 2,000 or 3,000 may develop.

DISCUSSION

DR. L. A. CALKINS.—For the past several years we have made leucocyte counts during labor and on the third day postpartum, and have obtained counts ranging from 6,000 to 22,000 in patients who are clinically normal. On the third day after delivery, the counts are generally higher than during labor. As a rule we do not consider a count below 15,000 as indicative of any abnormality.

DR. G. D. ROYSTON.—My personal experience with leucocyte counts in pregnancy consists in cases with tuberculosis, where a shift to the left in either the Arneth or the Schilling hemogram apparently indicates activity. We have largely discarded the total leucocyte count and are depending more upon the differential count. In this latter procedure it is essential to have good stains, and we have been forced to rely upon imported products.

DR. PLASS (closing).—Modern differences in nomenclature make it difficult to interpret differential counts from various clinics, but there can be no doubt that they

are of more value than total counts. The average intern does not make counts upon which too much reliance can be placed. Little attention should be paid to minor variations in the total count since increases or decreases of several thousands may occur within a short period from physiologic causes.

DR. HENRY SCHMITZ, CHICAGO, discussed the Indications for Various Methods of Treatment in Primary Carcinoma of the Uterine Cervix.

Any choice of method of treatment in carcinoma of the cervix must be based upon the extent of the disease, and the author years ago proposed a clinical grading, which has been widely adopted, as follows:

Group 1. Beginning nodule or ulcer, not larger than 1 cm. in diameter, with normal mobility of uterus and adnexa. Treatment is surgery or radium.

Group 2. Tumor or ulcer involving one-half or all of the cervix in either the transverse or longitudinal diameter, together with a dough-like consistency of the paracervical tissues, and loss of uterine mobility, due to decreased elasticity of adjacent connective tissue. Treatment is radium and x-ray.

Group 3. Tumor or crater of cervix with (a) rigidity of paracervical tissues; (b) invasion of parametria; and (c) invasion of regional lymph nodes, the entire mass having restricted mobility. Treatment is radium and x-ray.

Group 4. Advanced lesions showing (a) involvement of parametria and regional lymph nodes with fixation; (b) involvement of bladder, vagina, or rectum; (c) distant metastases; and (d) advanced cachexia. Treatment is symptomatic or palliative.

Contraindications to surgery and radiation therapy were discussed and the end-results in 332 cervical carcinomas detailed. In Group 1, the chance for recovery is about 8 in 10; in Group 2, 4 in 10; in Group 3, 1 in 8; while in Group 4, no hope for cure should be entertained.

DISCUSSION

DR. F. J. TAUSSIG.—Since 1917, I have treated approximately 550 patients with carcinoma of the cervix, but have operated upon only 40 patients, about 8 per cent. Operative mortality will be very low (5 or 6 per cent) if only Group 1 cases are submitted to operation. Infection should be cleared up before operation, since it greatly increases the risk. Occasionally, radium is not at all effective even in early cases, and, moreover, I feel sure that sometimes it scatters the tumor more than surgery does, bone and chest metastases being more commonly noted. I believe that gold radon seeds are a useful adjunct which has not been mentioned.

In advanced cases, the use of blood transfusions helps greatly to reduce the toxemia. Occasionally, colostomy reduces the toxemia by eliminating the block of the rectum, and, moreover, may serve to relieve pain and pressure.

DR. W. T. BLACK.—No doubt most of us will concede that radium is the remedy of choice in practically all cases of carcinoma of the cervix. Occasionally, a very early lesion will make us think seriously of operation, but whenever there is any doubt about operability, radium should be chosen. I have subjected only one patient to operation during the past three years, and then only after radium had been used.

As prophylactic measures, aimed at the prevention of cancer of the cervix, biopsies should be performed in all suspicious cases, all growths should be removed, lacerations corrected, and endocervicitis relieved. Badly diseased cervices should be amputated in women past forty years of age, whereas cautery treatment is the method of choice in younger individuals. Reports in the literature and my own experience emphasize the fact that cancer rarely follows amputation or cauterization of the cervix. Correction of these precancerous lesions will, in my opinion, greatly reduce the incidence of carcinoma of the cervix.

DR. H. S. CROSSEN.—I believe that patients in Group 1 should be given the benefit of surgery in addition to radiation, because of the uncertainty as to the extent of the cancer-killing effect of radiation in the individual patient. This effect varies greatly in different patients, and occasionally falls far short of what is reasonably expected. We know that operation in these early cases will remove all presumably involved tissue, but we do not know that radium will kill all cancer cells in that removable tissue in that particular individual. It is to be hoped that advances in radium treatment will some time give us that certainty. Until then I prefer to employ operation in addition to radiation.

DR. EMIL REIS.—The operation for carcinoma of the cervix which I proposed in 1895 was designed to include a radical dissection of the pelvis similar to the dissection of the axilla for cancer of the breast. Wertheim followed this plan in his first ten cases, but the mortality was so serious that he receded from this radicalism. What is now called the Wertheim operation is not radical; in fact, its very first steps make it impossible to make a radical dissection, as they violate the principle of block dissection.

I have patients living without recurrence for twenty years, but I cannot present complete statistics of my results, because my patients are widely scattered and I cannot obtain follow-up reports. Even five-year end-results do not mean much; for example, the very first patient I operated upon in 1896, came back in 1905 with extensive carcinoma of the external inguinal glands, which I removed successfully.

The carcinoma operation, as I intended it, is a difficult and laborious piece of work, and I am not anxious that everybody should take it up. I hope that radium will relieve us of the need for these severe operations.

DR. SCHMITZ (closing).—If radiation therapy is employed on all cases, even in those of Group 1, we will reduce the mortality and morbidity inherent in surgical treatment and will definitely increase the number of five-year, good end-results. Since 1917 we have treated all our cases with radium and the results have been excellent. Statistics may prove anything, but they do give relatively reliable information of what can be done and therefore cannot be discarded.

Much is yet to be learned about x-ray and radium therapy, and as progress in technic is made we may expect even better end-results.

DR. GEORGE GELLHORN, ST. LOUIS, discussed **Local Anesthesia in Labor.**

Various popular methods of anesthesia in labor carry certain dangers for the child and for the mother. I believe that *hypalgesia* is all that is needed in the first stage, and that only the second stage requires *anesthesia*. This may be accomplished by light twilight sleep combined with local anesthesia, as follows:

1. When strong contractions occur every five minutes or oftener and the os admits at least two fingers, morphine ($\frac{1}{4}$ grain) and hyoscin (1 c.c. = $\frac{1}{130}$ grains) are given.
2. One to one and a half hours later, depending upon the degree of somnolence, $\frac{1}{2}$ c.c. of hyoscin is given.
3. This light twilight sleep lasts, as a rule, through the first stage and well into the second. When it proves insufficient, a little gas may be given with contractions, but this is discontinued when the head becomes visible.
4. At this stage, the perineal skin, the lower circumference of the vulva, the perineal body, and the levator muscles are infiltrated with $\frac{1}{2}$ per cent novocaine solution, with 3 drops of adrenalin to the ounce. Two or three ounces are needed.
5. The levators relax immediately and the introitus is seen to gape. Delivery, whether spontaneous or by forceps, is painless, and episiotomies can be made and, later, repaired painlessly and bloodlessly.

6. Patients may complain of a dull ache in the back. Of the two component pains of parturition, viz., pressure on the sacral plexus and stretching of the pelvic floor, the latter and more severe is eliminated by local anesthesia.

7. Uterine contractions usually decrease in force as soon as the local anesthesia becomes effective, i.e., about five minutes after infiltration, but may be stirred up again by a few drops of pituitrin if the progress of labor is retarded.

8. Perineal tears are infrequent owing to the marked relaxation of the vaginal outlet. Moreover, episiotomies are made rather freely.

9. The child is not affected by the small amounts of morphine and hyoscin.

10. The third stage shows no alteration.

11. The technic is simple and can be carried out in the hospital or in the home. In the latter it obviates the need for an anesthetist.

12. In complicating disease, contraindicating inhalation anesthesia, the method has particular advantages.

DISCUSSION

DR. RUDOLPH HOLMES.—I have never used nerve block or spinal anesthesia because I have always been afraid of them, while the trouble with ethylene and ether is that they are explosive. My early experience with morphine and scopolamine was very discouraging because of the bad effects on the babies. If these drugs are given early in labor they may be of value, but when given late they may be disastrous to the child, and therefore I have always been against twilight sleep and its modifications.

DR. J. P. GREENHILL.—Personally, I have not used morphine during labor for a number of years. Magnesium sulphate is used for analgesia and spinal anesthesia for abnormal labor. Local anesthesia is employed for cesarean sections and for episiotomies.

DR. CARL H. DAVIS.—My idea of handling the first stage is identical with that described by Dr. Gellhorn, except that I prefer heroin to morphine. I have not used local anesthesia during the second stage because I have always been fearful that it might predispose to infection. I am opposed to the use of infiltration anesthesia in vaginal plastic surgery. Recently we have abandoned the use of ethylene for fear of an explosion, and have gone back to nitrous oxide-oxygen for second stage analgesia and anesthesia.

DR. GELLHORN (closing).—Individualization of the patient is necessary in choosing the proper anesthetic. I have used nitrous oxide-oxygen in many cases successfully, but its use requires a trained anesthetist. Local anesthesia gives very considerable relief and may be given without assistance. I am not sure it is wise to eliminate by artificial means all memory of the highest function that women can fulfill.

The method which has been proposed is simple, and will relieve our patients of useless pain during labor.

DR. Q. U. NEWELL, ST. LOUIS, demonstrated **A New Instrument for Abdominal Tubal Insufflation**, which has proved very satisfactory.

DR. E. L. CORNELL, CHICAGO, demonstrated **A Mechanical Cross-Index of Summary Cards in Obstetrics and Gynecology** for use in private offices as well as in hospital record rooms.

DR. A. HARTMANN, ST. LOUIS, discussed the use of **A New Combined Solution for Combating Either Acidosis or Alkalosis in Children.**

DR. G. LIESE AND DR. E. S. AUER, ST. LOUIS, discussed **The Diagnostic Test of Early Pregnancy from Urine**, and presented fresh experimental animals demonstrating the appearance of the blood spots in the ovary, which constitute the positive sign of pregnancy.

DR. W. J. DIECKMANN, ST. LOUIS, discussed **A Case of Lipoid Nephritis in Pregnancy.**

A sixteen-year-old white girl was admitted on Nov. 22, 1929, when twenty-two weeks pregnant, because of severe edema of three weeks' duration. There was a general anasarca, the blood pressure was 160/115 to 200/150, the basal metabolic rate was minus 13.5 per cent. The urine, which contained 1.0 per cent of albumin, showed numerous hyaline and granular casts together with many doubly refractile lipid bodies. There was a moderate anemia. Blood chemistry revealed total N.P.N, 47 mg. per cent (became normal in forty-eight hours); total serum proteins, 4.6 per cent; cholesterol, 350 mg. per cent, and total lipoids, 2018 mg. per cent. There was slight edema of both retinas. Microscopic examination of the capillaries revealed moderate dilatation of the venules, some beading, and definite slowing of the flow.

The patient miscarried the day after admission. Novasurol and thyroid extract (up to 4.8 gm. per day) did not relieve the edema, which finally responded to a salt-free, fat-poor diet containing 50 gm. of protein. As the edema decreased, the protein was increased to 100 gm. per day, to balance a loss through the urine of 12 to 22 gm. per day (the urine at one time contained 5.9 per cent albumin). The patient lost weight from 54.5 kg. to 39.8 kg. On discharge the blood pressure was 140/110.

DR. PERCY SWAHLEN, ST. LOUIS, showed a case of **Unusual Pelvic Deformity Producing Dystocia.**

The patient, aged thirty-five years, had had one spontaneous delivery six years previously. Three months later, pain developed in both hips, and shortly afterward the legs became 1½ inches shorter. There was no history of rheumatism or of injury to the extremities, except that she had been struck on the right knee when six years old. When first seen, pelvic examination was difficult because of inability to separate the knees for more than a few inches. X-ray examination showed marked arthritic deformities of both hip joints, with large exostoses projecting from the upper margins of the acetabulum over the heads of the femora and markedly limiting abduction.

Vaginal delivery seemed impossible, and cesarean section was performed, both mother and child surviving.

X-ray films were shown and the patient was presented.

DR. PALMER FINDLEY, OMAHA, presented a specimen of **Inversion of the Uterus.**

The specimen showed complete inversion of an early puerperal uterus.

It was emphasized that it is important first to control bleeding, then to combat

shock, and finally to correct the inversion. Hemorrhage is the most frequent cause of death in such patients, although sepsis accounts for fully one-third of all fatalities.

In the absence of marked hemorrhage and profound shock, and under good aseptic conditions, early replacement, which is usually easy, is the method of choice. Where vaginal replacement has failed, and in the presence of probable sepsis, vaginal hysterectomy gives very excellent results.

DR. F. EMMERT, ST. LOUIS, discussed a case of **Twin Lithopedion in Tubal Pregnancy**, and presented the specimen. This is probably the only case on record.

The patient, aged fifty years, presented a hard tumor mass, which filled the entire true pelvis and bulged into the rectum. For twenty years there had been more or less bearing down, with steadily increasing pressure on the bladder and rectum. At laparotomy, the mass was adherent to the anterior abdominal wall, to the fundus of the uterus, and to the great omentum. This mass contained long bones of the extremities, ribs, and cranial bones, which had partially discharged into the upper part of the fundus, so that several bones were imbedded deeply in the uterine wall, lying free in the culdesac, the second mass, the size of an orange, was surrounded by a dense layer of calcium. Both ovaries were normal. The left tube had a normal abdominal opening, but the ostium of the right tube could not be found.

X-ray plates of the masses showed evidence of two fetuses, the larger one from the culdesac representing a fully formed fetus, while the smaller from the fundus showed an irregularly shaped mass of bones, remnants of a second fetus. Connected with the smaller portion, there was an irregular area of calcification resembling calcified membranes rather than actual bone formation.

DR. F. P. McNALLEY, ST. LOUIS, described **A Case of Very Early Carcinoma of the Cervix**, and presented the histologic sections.

The patient, a colored woman aged thirty-one years, was four months pregnant when first seen, and had had a bloody vaginal discharge for the preceding six weeks. The cervix was lacerated and presented a suspicious area, from which a piece of tissue was taken for diagnosis. Only one section showed anything suggestive of cancer and opinion was divided as to the diagnosis. On October 10, when twenty-six weeks pregnant, the patient miscarried. At that time there was absolutely no change in the appearance of the cervix. On November 7, tissue removed definitely showed carcinoma.

This is the earliest carcinoma he had ever seen.

DR. C. F. MOON, OMAHA, described **A Case of Breus' Mole**, and presented the specimen.

The patient was a secundigravida, aged twenty-eight years, whose last menstrual period was Dec. 25, 1925. The pregnancy apparently progressed normally until the fourth month, after which the uterus did not increase in size. The mole was delivered spontaneously on Sept. 15, 1926. Since then the patient has had a normal, full-term pregnancy.

This type of mole, which does not grow rapidly, is rather uncommon. Pathologically, the amniotic cavity was invaded by numerous, hazelnut-sized subchorial hemorrhages.

DR. R. H. LUIKART, OMAHA, described **A Case of Hydatidiform Mole**, and presented the specimen.

DR. R. J. CROSSEN, ST. LOUIS, described **A Case of Gumma of the Cervix**, and presented the microscopic slides showing the lesion.

The patient, aged thirty-four years, had had a seven months' miscarriage, followed by a full-term stillbirth, and gave a history positive for syphilis which had been treated for two years to a negative blood Wassermann reaction. She was first seen about the middle of October, when the cervix showed an erosion extending 1.5 cm. from the external os, which bled freely on manipulation, but did not look like a carcinoma. Two weeks' treatment with mercury and arsphenamine produced no change in the appearance of the lesion. Biopsy was finally done and the sections showed an undoubted gumma of the cervix, a lesion which is easily confused with carcinoma or tuberculosis.

DR. S. A. WEINTRAUB, ST. LOUIS, described **A Case of Combined Extrauterine and Uterine Pregnancy**, with a live mother and two living children.

The patient, a colored woman, aged thirty-eight years, had previously had two full-term children but no miscarriages. The date of the last period was indefinite. On Dec. 26, 1928, there was a sudden attack of severe pain in the left lower abdomen, which confined her to bed for several days, during which there was slight vaginal bleeding. Progressive enlargement of the abdomen had been noted, but the patient did not suspect that she was pregnant.

On examination, May 31, 1929, a diagnosis of twin pregnancy was made, with one child in cephalic and the other in transverse presentation. The blood pressure, urine, and blood were normal.

On June 7, 1929, the patient delivered spontaneously a premature child weighing 2200 gm. There was no tendency toward expulsion of the other fetus, and careful examination led to a diagnosis of an extrauterine, living fetus. This second child which weighed 1420 gm. was delivered by laparotomy. Severe bleeding precluded the possibility of removing the placenta, which was widely adherent, so the area was carefully packed and the abdomen closed. The placenta was expelled through the abdominal sinus on July 3.

When last seen on Nov. 6, 1929, the mother and both children were apparently well and normal except for certain deformities of the extrauterine child, resulting from the oligohydramnios.

DR. L. A. CALKINS, KANSAS CITY, discussed **An Interesting Combination of Ovarian Cyst and Pelvic Inflammatory Disease**.

The patient, a colored woman, aged thirty-eight years, complained of pain in the lower abdomen, more marked on the left, heaviness in the pelvis, and an inconstant leucorrhoea. She had had two children, who were living and well, but no miscarriages.

Examination showed a firm, cystic (?) mass filling the right pelvis and extending far over to the right and up to the umbilicus. The cervix was high up and to the left, while the uterus could not be located. There was a hard, tender ledge around the rectum constricting its caliber considerably, but not involving the mucosa. Hemoglobin 51 per cent, R.B.C. 3,640,000, W.B.C. 9,300. Sedimentation 29 mm. in one hour. The urine showed a trace of albumin.

The large mass could be an ovarian cyst or a uterine fibroid, or possibly a solid tumor of the ovary. The perirectal induration could be inflammatory or malignant.

Laparotomy, which was done after a week of bed rest with normal temperature, revealed a large multilocular cyst of the right ovary with bilateral salpingitis. The cyst was removed with some difficulty, after which the tubes were excised without any apparent injury to the bowel. The patient promptly developed typical colon-bacillus peritonitis, and died in less than twenty-four hours.

Autopsy revealed, in addition to the general peritonitis, other evidences of acute infection in the heart, spleen, kidneys, and other organs. The operation specimen showed both acute and chronic salpingitis with a small tuboovarian abscess.

Closer attention should have been paid to the preoperative findings, especially the blood sedimentation rate, and operation should have been confined to removal of the cyst.

DR. E. LEE DORSETT, ST. LOUIS, presented A Brief Analysis of the Treatment of 186 Cases of Eclampsia by Intramuscular Injections of Magnesium Sulphate.

In 1923 we began the intramuscular injections of magnesium sulphate for the control of eclamptic convulsions and to date have treated 186 cases in this manner with a maternal mortality of only 7 per cent. We have found recently that by decreasing the amount of the drug given at each injection and by giving 500 to 1000 c.c. of 20 per cent dextrose intravenously, we have improved our results. This treatment serves to increase urinary output quite promptly.

In this series we did only 9 cesarean sections, since I feel that this procedure is indicated in only a very few patients.

Our patients are first treated as purely medical cases, and when we have the eclampsia well under control, labor is induced, generally by means of a bag. Those who do not respond to conservative treatment are delivered by cesarean section. The routine treatment is as follows:

1. Ten c.c. of 20 per cent magnesium sulphate solution intramuscularly, deep into the gluteal region. Repeat injections every one or two hours if convulsions continue.
2. Colonic irrigations.
3. Gastric lavage until the wash water returns clear. Then introduce into the stomach 60 c.c. of concentrated magnesium sulphate solution (for purgative effect).
4. Five hundred to 1000 c.c. of 20 per cent dextrose solution intravenously every twelve to twenty-four hours, as conditions indicate.

Department of Maternal Welfare

CONDUCTED BY FRED L. ADAIR, M.D., CHICAGO, ILL.

Symposium on Maternal and Fetal Mortality*

AMERICAN PUBLIC HEALTH ASSOCIATION
MEETING AT MINNEAPOLIS, MINN., OCTOBER, 1929

Antenatal, Intranatal, Postnatal Conditions in the United States, John Osborn Polak, M.D., Brooklyn, N. Y.

Childbearing in the United States today is a hazardous adventure, the many dangers of which the public does not seem to appreciate. Although the ordeal is still considered a physiologic process it takes place in an individual who is different from the primitive woman who lived out in the open, was fed on fruits, vegetables, milk and fish, developed her muscles by physical labor and was protected from infections by religious customs and rites; the civilized woman eats and drinks what she pleases, often lacks outdoor exercise and is subject to many diseases. Therefore, she often presents herself as an impaired risk because of developmental defects, sequelae of dietary errors, lack of physical exercise and because of stigmas of certain previous or existing diseases. Then she may be attended by a supposedly skilled physician whose poor judgment may tempt him to so modify labor and delivery as to create pathologic conditions; or she may have an unskilled attendant whose ignorance of asepsis, cross infections, and application of instruments puts her life and that of the baby in great danger.

Spontaneous normal deliveries, statistics show, will occur in 90 to 95 per cent. Uncontaminated spontaneous labors are afebrile. Repeated vaginal examinations, instrumentation, and manipulation all mean contamination.

Maternal mortality in the United States from all puerperal causes is generally stated to have shown no improvement in the last twenty years because the good work of the trained and skilled attendant, who practices aseptic conservatism, is counterbalanced by the poor work of the unskilled.

Direct causes of maternal mortality and morbidity are headed by infections, toxemias, hemorrhage, obstetric accidents and operative deliveries. There were 6.7 deaths per 1,000 mothers in the birth registration area of the United States between the years of 1915 to 1927. Puerperal sepsis alone took a toll of 2.5 deaths per 1,000 mothers, or 30 to 43 per cent. Toxemias caused 26 per cent of all maternal deaths. These are preventable to some extent as has been demonstrated in large maternity clinics and in the several out-patient teaching services throughout the country where a simple aseptic surgical technic has been adopted and interference with labor reduced to a minimum.

Predisposing causes of maternal mortality and morbidity are lack of proper prenatal, intranatal, and postnatal care and education of the patient; her social status, environment, color, age, and inherent resistance to infection. This results in failure to diminish fatalities due to toxemias and antepartum hemorrhage and unrecognized

*Abstracts prepared by Manuel Spiegel, M.D., of Chicago, Ill.

malpositions and disproportions, monstrosities and syphilis. It increases operative interference with labor by an unskilled and untrained attendant, causing trauma, hemorrhage and infection. The operative incidence in teaching hospitals is very low: in a study of over 8,000 of Dr. Polak's records, it is found that the incidence per 1,000 is—forceps 23 to 34, version 8 to 20, cesarean section 8 to 15. The deaths of mothers under twenty years of age is higher than from twenty to twenty-five years, because, probably, of the large number of illegitimate pregnancies that occur in this class which are interrupted with lack of aseptic care. The maternal mortality rate is higher in the colored race than in the white as shown by comparison of all puerperal deaths in 1927 in several states of the north with those in the south where the ratio of colored population is larger: Minnesota, North Dakota, and Wisconsin range from 4.4 to 5.3 per 1,000; Mississippi, Louisiana, and Florida range from 8.7 to 11 per 1,000. It is also interesting to note that the incidence of puerperal sepsis is greater among those who do not have a history of a previous streptococic infection, the ratio being about 10:1.

Fetal mortality and morbidity depend, to a large extent, upon the same causes as those of the mother and may be outlined as those due to placental disease, dystocia and character of labor, and the type of operative delivery. Placental disease can be reduced tremendously by watchful care of the mother by her physician to check intercurrent infections and toxemias, to treat syphilis during pregnancy and to induce premature delivery in a woman presenting a history of habitual premature separation of the placenta. Dystocia due to malpositions and disproportions is a rarity. The reports of abnormal presentations for the following hospitals during 1928 are: Rotunda Hospital, in 3,779 deliveries, 3,534 were vertex presentations and 245 were abnormal presentations; Long Island College Hospital and Methodist Episcopal Hospital each report about 322 abnormal presentations in 7,000 consecutive cases. In these hospitals, therefore, reporting a total of about 18,000 cases, 95 per cent were vertex presentations and 92 per cent terminated by spontaneous delivery. The incidence of stillbirths, including all babies dead in utero before and during delivery averages about 28 per cent in the following hospitals as compared with 7.5 per cent in hospitals of the country at large:

<i>Hospital</i>	<i>Deliveries</i>	<i>Per Cent Stillbirths</i>
Rotunda Hospital	3,779	2.9
Greenpoint Hospital (Brooklyn)	2,016	3.2
Long Island College Hosp. (Brooklyn)	3,000	2.7
Chicago Lying-In Hospital	21,000	2.4
Jewish Hospital (Brooklyn)	2,229	3.1

In conclusion, it is evident that better work in obstetrics in the United States at large can be done.

Effect of Antepartum Care of the Mother, Blanche M. Haines, M.D., Washington, D. C.

Promotion of antepartum care has become noticeably increased in the United States since the passage of the Maternity and Infancy Act by Congress in 1921. In 1922 the birth registration area contained 30 states and in 1927 it had increased to 40 states and the District of Columbia.

Comparison of maternal and infant mortality in 1922 and 1927 is as follows:

Maternal mortality rate was	65	per	10,000	live	births	in	1922,
							and 62 per 10,000 live births in 1927.
Infant mortality rate was	76	"	"	"	"	"	1922,
	and 64	"	"	"	"	"	and 1927.

Infant mortality due to:

Gastrointestinal diseases	13	per	10,000	live	births	in	1922
	8	"	"	"	"	"	1927
Respiratory diseases	14	"	"	"	"	"	1922
	10	"	"	"	"	"	1927
Natal and prenatal causes	36	"	"	"	"	"	1922
	34	"	"	"	"	"	1927

Maternal mortality due to:

Albuminuria and convulsions	18	"	"	"	"	"	1922
	15	"	"	"	"	"	1927
Puerperal septicemia	23.7	"	"	"	"	"	1922
	23.9	"	"	"	"	"	1927

(Abortions were responsible for 45 per cent of deaths from septicemia. About nine-tenths of cases in the sepsis group had inadequate or no prenatal care.)

Antepartum care of the mother, therefore, has reduced infant mortality, due to natal and prenatal causes, and maternal mortality, chiefly, from albuminuria and convulsions.

The Effect of Prenatal Care Upon the Infant, Clifford G. Grulee, M.D., Chicago, Ill.

Effect of prenatal care upon the infant is obvious. The treatment of syphilis during a pregnancy gives the best evidence as to the value of prenatal care for the infant. Acute infections of the mother, eclampsia, trauma, and induction of labor are conditions in which at least we may hope to get better results. But in the present state of our knowledge we have practically no control over the infant mortality and morbidity due to congenital debility or malformation.

Causes of congenital debility are:

1. "Unknown causes"	60 per cent	} 75 per cent unknown causes
2. Twins and triplets account for	15 per cent	
3. Disease of the mother	8 per cent	
(Due to tuberculosis, anemia, nephritis, and heart disease)		
4. Habitual premature labor	4 per cent	
(Due to placenta previa and syphilis)		

Maternal and Infant Mortality in Boston, C. F. Wilinsky, M.D., Boston, Mass.

In a study of 984 maternal deaths by Dr. Coffin of Massachusetts, 58 per cent were attributed to toxemias, sepsis, and hemorrhage, all avoidable causes, as about 89 per cent of this series had not received adequate prenatal care.

Infant mortality reduction, however, has been quite noticeable since out of every 1,000 born twenty-five years ago, 30 more infants died before the age of one, than today. That is, infant mortality rates of 100 were very prevalent while today they are less than 70. A study of the most prevalent causes of death, under one year, emphasizes a marked reduction from gastric diseases. But there has been very little reduction in deaths from prematurity, injuries at birth and congenital malformations.

Adequate training of physicians in obstetrics and pediatrics will strongly influence the reduction of deaths of mothers from toxemia and sepsis and of infants from prematurity and injuries at birth.

**Maternal and Infant Care in a Public Health Program, J. H. Mason
Knox, Jr., M.D., Ph.D., Minneapolis, Minn.**

A successful public health program provides adequately for maternal and early infant care. It emphasizes the importance of prenatal care to the public, especially to the expectant mother, by lectures and literature. In many states public health nurses are sent to them and give them some advice and help them make necessary arrangements for delivery. In the large cities and even in some small districts it provides prenatal clinics.

Natal care responsibilities of the health department chiefly consists in the prompt registration of births and the keeping of records of maternal and infant deaths and their causes. The regulation of the practice of midwives, also, is usually under the jurisdiction of this department.

Postnatal care is carried out by visiting nurses, and letters are sent each month to the mothers which inform them in a general way about their care and that of the babies. The health department is also interested in the proper feeding of the baby and its hygiene which it carries out through infant welfare stations, lectures, and letters.

**The Effect of Postnatal Care on the Infant, Frederic W. Schultz, M.D.,
Minneapolis, Minn.**

Infant mortality has been reduced in every part of the civilized world during the last decade. This reduction has affected every age group except the first month of the infant's life, particularly, the first two weeks; in this group the mortality figures have remained almost as high as ever.

The chief causes of postnatal mortality are: (1) Congenital anatomical defects, (2) prematurity, (3) birth injuries, (4) infections, and (5) poor thermal control. Of these, prematurity and infections have the largest death toll.

Congenital anatomical defects, fortunately, furnish the smallest part of the infant mortality at this age. They are amenable to treatment only in exceptional instances.

Prematurity causes fewer deaths of infants because of the advanced knowledge of care and infant feeding.

Birth injuries can be lessened largely by better obstetric care during delivery. However, it has been shown by Adair and others that injuries resulting in hemorrhage can occur in supposedly easy short labors.

Infections involving the respiratory tract and the lymphatic structures of the throat are the most common. These rapidly become serious because of the limited defensive immunologic action of the infant at this age. This can be prevented largely by avoiding contacts with anyone having the slightest cold and by the proper care of the infant as soon as it should contract an upper respiratory infection.

Thermal control, particularly in a premature infant, is inadequate. The mechanism lacks the capacity to quickly adjust itself to fluctuations in external temperatures and sudden collapse and heart or respiratory failure can and frequently do occur. With simple mechanical devices the proper thermal conditions can be maintained for the premature infant and its body temperature safeguarded.

**The Effect of Postpartum Care on the Mother, Jennings C. Litzenberg,
M.D., Minneapolis, Minn.**

Postpartum care is indispensable to the welfare of the mother. The ultimate aim is to restore her to as good physical and mental health as she had before the pregnancy. The mother must be carefully watched during the immediate puer-

perium, or that time during which she is in bed. Anemia and nervous exhaustion are not infrequent causes of delay in restoration of the mother to health. Infections, especially cystitis and pyelitis, which are the commonest complications, should be looked for not only by evident symptoms, but by routine physical and laboratory examination. And before the patient is discharged from the hospital she should be examined, any abnormalities found should be corrected or treated, and she should be instructed to return for a check-up examination at the end of the intermediate puerperium which is on the average about six to eight weeks during which time the mother is informed what she should do and what she should not do. Patients who recover from toxemias of pregnancy are carefully reexamined and treatment continued until the health is restored. Acquired displacements of the uterus which early were treated with special exercises, such as knee-chest position or the kangaroo walk in cases of retrodisplacements, should now be corrected and kept in normal position with an accurately fitted pessary. Dr. Litzenberg states that in his experience cases are cured in 90 per cent of retroversions when a pessary is fitted soon after delivery, while if introduced at a later time the failures are at least 90 per cent. Cervicitis is another condition that should be cared for at this time and treatment continued during the remote puerperium which extends indefinitely until the effects of childbirth are healed. Since it is known that between 80 to 90 per cent of infected torn cervixes and erosions can be cured and that these conditions are to be considered precancerous, it ought not to be difficult to appreciate the importance of postpartum care.

Effect of Intrapartum Care on the Mother, J. P. Greenhill, M.D., Chicago, Ill.

Analysis of the results at the Chicago Lying-in Hospital show that there is occasion for increased maternal mortality and morbidity because of the higher incidence of operative deliveries in this hospital than in general obstetric practice. However, in the 23,136 deliveries in the past nine years, there were 57 deaths, or only 24.6 per 10,000. Of these there were three deaths from septicemia, but only one resulted from an infection which developed in the hospital.

Maternal morbidity at the Chicago Lying-in Hospital is likewise very low, even though the strictest standard is adopted; namely, that every elevation of temperature up to 100° F., or above, even if recorded only once from the moment of delivery until the patient is discharged from the hospital. Under this standard, the total morbidity among the 23,136 patients was 10.8 per cent. However, a fair proportion of this morbidity was due to extragenital causes.

Management of labor at the Chicago Lying-in Hospital is essentially the same as in any large teaching or special maternity hospital.

The Effect of Intranatal Care Upon the Infant, Walter R. Ramsey, M.D., Minneapolis, Minn.

The mode of delivery is essentially related to childbirth injuries. In spontaneous deliveries the incidence of injuries of the baby is very small as is expected. Ramsey believes that in Europe, particularly in the Scandinavian countries, where fully 85 per cent of the children are delivered by well-trained midwives, the infant mortality and morbidity is much less than in this country where almost the same percentage of cases are cared for by physicians.

Obstetric interference during labor is accompanied with a large number of injuries to the infant. Injuries about the face and head as a result of forceps, paralysis of arms from injured brachial plexus, fractured femurs from traction,

are often seen; many of these are transient, but not infrequently some of these injuries are carried through life.

Unnecessary interference is responsible for a good percentage of these cases and this can be much reduced.

The Status of Maternal and Infant Mortality, Julius Levy, M.D., Newark, New Jersey.

Maternal mortality in Newark with special reference to deaths in early periods of pregnancy, particularly due to abortions, has been carefully followed up by Julius Levy during the years 1924, 1927, and 1928. In his report are considered 232 puerperal deaths of which the period of gestation could not be traced (as this information is not included in the death certificates) in 20.

In the third trimester of pregnancy, maternal mortality has decreased since 1924, but it is still high in comparison with other countries. About 18.4 per cent of maternal deaths occurred in the first trimester; and 30.2 per cent in the first and second trimesters, of which 60 per cent were due to abortions.

Abortions cause 20 per cent of the maternal mortality.

American Journal of Obstetrics and Gynecology

GEORGE W. KOSMAK, M.D., EDITOR

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Editorial Comments

The Prevention of Congenital Syphilis

THE aims and purposes of the recently inaugurated White House Conference on Child Health and Protection have been lucidly placed before the readers of the Journal in the March issue of this year. In this scheme of conservation of the nation's most valuable assets—its children—problems of the utmost importance will, for the first time in the history of our country, be attacked in a thoroughly systematic, scientific and nation-wide manner. Such an organization will give a new impetus to already existing but scattered movements of reform. Among the many problems that will come up for consideration will be that of the prevention of congenital syphilis, in which every practitioner of obstetrics may in time be asked to lend a helping hand.

To congenital syphilitics, life is, indeed, a valley of tears. The only piece of good luck that may possibly happen to them, is in case they arrive on the scene in a macerated condition or if they are stillborn. If delivered alive, their troubles begin. If premature, as is so often the case, these puny creatures with their wrinkled skins and the faces of sad old men, fortunately perish in a short time. If they are born at term, they may be covered with eruptions or present fissures about the lips or the anus that do not heal. There are others who are seemingly normal at birth, but develop "snuffles" later, with consequent respiratory embarrassment. And all this variegated misery is suffered in vain; for even if, with careful medical and nursing attention, the child has been pulled through for the moment, death from some trivial cause claims about 50 per cent within the first year. Considering this belated and the immediate mortality, it is no wonder that Osler called congenital syphilis "one of the six best killers."

'Tis a pity that not all congenitally syphilitic children die in early life, for the ultimate fate of those who survive is far from enviable. Physically and mentally, they drag a ball and chain through their entire existence. There are the keratitis and other eye lesions, oto-

sclerosis and Hutchinson's teeth, saber-tibia and scaphoid scapula, various cutaneous and mucous membrane affections, juvenile tabes and paresis, and a host of other manifestations. Mentally, too, they bear the stamp of inferiority, and their inherited taint may turn them into morons and imbeciles or produce in them a low moral fiber which leads such congenital syphilitics so often into conflicts with the law. These, to be sure, are extreme cases; but even if such manifest sequels are absent, the congenital syphilitic is never quite normal. He does not play as other children do, he is called "queer" in school, and he acts queerly all through adult life. He is at odds with himself and the world in general—a square peg in a round hole. And he may beget children who, likewise, are afflicted with physical or mental inferiority or even with actual syphilis, for instances of syphilis in the third generation are by no means rare.

Of course, much can be done by proper treatment, but such treatment must be very extensive and prolonged, and for this necessity the majority of syphilitic parents have neither intelligent understanding nor sufficient means.

Welander, of Stockholm, who first recognized the need for extended and institutional treatment and took such children into his own house, affords us a beautiful example of true humanitarianism, and several such "Welander Homes" were created in the Nordic countries as well as in Germany and France. The available reports contain some remarkable successes, but after all the net result was not commensurate with the immense amount of effort expended.

One is forced, therefore, to conclude that the best treatment of congenital syphilitics consists of *preventing* them from becoming such. Theoretically, this object might be accomplished by forbidding syphilitics to marry, but we know only too well that prohibition does not prohibit. For practical purposes, therefore, our prophylactic measures cannot be set in motion in most instances until after conception has taken place. Prevention, then, will depend on timely discovery of the disease in the mother. The routine employment of the Wassermann or kindred tests in many prenatal clinics has been a great step forward and deserves unstinted praise. Unfortunately, serologic examinations have not proved wholly reliable in pregnant women, for in a certain, though small percentage, they have been negative in patients with manifest syphilis and, conversely, positive in definitely healthy individuals. In how far this eccentric behavior of the Wassermann reaction depends on the pregnant state or in possible mistakes in the laboratory, need not detain us at this moment; the fact remains. Moreover, the laboratory should be the aid, not the fountainhead of any diagnosis, and syphilis has been shrewdly recognized by our predecessors even before Wassermann made his immortal contribution to science. The clinical diagnosis of syphilis in pregnancy should, there-

fore, be much more searching than it is in reality. It should begin with a thorough history. The phrase so usually found in the records, "Patient denies syphilis (and gonorrhea)," strikes one as fatuous. The woman who knows of her infection, will, as a rule, not admit it, but in most instances she is wholly ignorant of having the disease and acts in good faith when she gives a negative answer. The examiner, however, may obtain valuable clues from the history of previous abortions or stillbirths, from tactful inquiries into the health of husband or children, and from delving into the patient's personal condition past and present. The examination should embrace the entire body, and at this point we may as well admit to ourselves that in obstetric practice this is usually omitted. Yet, to the suspicious and, therefore, alert examiner, traces of a former syphilitic infection will appear somewhere on the skin or mucosae, in glands or bones, in the behavior of the reflexes or blood pressure. Now is the time to use the blood and, if necessary, the spinal fluid Wassermann test for further confirmation and to study the blood picture for any suggestive lymphocytosis.

If all this be considered too much trouble, let us remember that the welfare of the whole race depends on such thoroughness.

Once the diagnosis is established, energetic treatment should be started at once and continued throughout pregnancy, *irrespective of any previous treatment*. We do not know just how soon the mother's spirochetes invade the placenta and the fetus; hence, the earlier treatment is begun, the better are the chances of success. The fact that syphilitic abortions do not often occur before the fifth month, does not exclude the possibility that the spirochetes are lodged in the placenta long before that term. But even if a syphilitic mother should not come for examination until late in pregnancy, arsenicals and mercurials should be administered without delay, for the small amount of anti-syphilitic drugs which the child would receive in utero and, later, in the mother's milk, would give it at least a little better start in life.

The best results, however, are obtained by early detection and energetic treatment of the disease throughout pregnancy. With such a régime, it is now generally accepted that 96 per cent of the children are born healthy and saved from the dire effects of congenital syphilis. And in this promising work for the betterment of the race, every obstetric practitioner can have his full share. In fact, the splendid undertaking of the White House Conference must fail in this particular fight against congenital syphilis unless it is supported by the cooperation of the individual obstetrician.

—George Gellhorn.

Department of Reviews and Abstracts

CONDUCTED BY HUGO EHRENFEST, M.D., ASSOCIATE EDITOR

Collective Review

The Obstetric Literature of 1929

BY J. P. GREENHILL, B.S., M.D., F.A.C.S., CHICAGO, ILL.

(Continued from page 600 of the April issue)

LABOR

General.—J. Kreis¹¹⁰ does not believe that the membranes are necessary for dilatation of the cervix. He advocates puncturing them when there is a small amount of dilatation and not when the cervix is completely dilated. (Rupture of the membranes should be performed only for a definite indication and after certain conditions have been fulfilled. If the head is not engaged when the membranes are to be punctured, the patient should first be placed in the Sims or the knee-chest position.)

E. Frey¹¹¹ is enthusiastic about the use of contraction-charts during labor. He contends that if spontaneous dilatation is to occur after premature rupture of the membranes it is usually accomplished after 150 uterine contractions. If dilatation is not complete after 200 contractions, spontaneous dilatation will not occur and a live child will not be delivered through the natural passages. (This is a revolutionary statement and if confirmed by others will be a strong argument in favor of the use of contraction-charts in all labor cases.) Delay in dilatation of the cervix in the presence of intact membranes has no deleterious effects for mother or child, hence the membranes should not be ruptured during the first stage of labor.

In the opinion of E. Philipp,¹¹² after rupture of the membranes, fetal hairs may always be found in the vaginal secretion if a careful search is made. The chief characteristics of a fetal hair are its pointed end and the presence of very little pigment. In a series of 6,500 cases, M. Schulze¹¹³ found that dry labor occurred in about 10 per cent. There was no maternal mortality and the morbidity was only slightly higher than that found in unselected cases. The fetal mortality was not higher than normal.

A. Stein in 1917 was the first to employ small doses of pituitary extract for inducing and shortening labor at term. He¹¹⁴ finds that a review of the literature bears out his own belief that when pituitary extract is administered in small and frequently repeated doses before delivery it offers a safe and effective method of inducing and shortening labor at term. M. Widera¹¹⁵ recommends the induction of labor by Stein's method but chiefly for patients in hospitals. (There is no doubt that pituitary extract when used after labor has once begun

even in 2 or 3 minim doses may occasionally do harm. For the induction of labor there is much less danger.) F. Demuth¹¹⁶ reports a series of 150 cases in which he used thymophysin to overcome weak uterine pains. In 35 cases there was only a moderate effect and in 9 cases no effect was observed. No harm resulted in any of the cases. (The reviewer used thymophysin in a number of cases of weak pains during the first stage of labor and was surprised at the rapidity with which the labors terminated spontaneously even though he never gave more than 3 minims at a time. The drug seems to be more potent than pituitary extract, hence only small doses should be used. It is seldom effective in starting labor but is helpful in cases of atony without exhaustion.)

Rupture of the membranes is the method of inducing labor suggested by D. L. Jackson,¹¹⁷ and according to D. G. Morton,¹¹⁸ the bougie is superior to the colpeurynter for this purpose. The latter is better for starting labor but it is attended by a definitely greater fetal mortality and maternal morbidity. In a series of 500 inductions of labor, R. Reis¹¹⁹ employed six methods. Pituitrin alone was successful in 26 per cent, castor oil in 53 per cent, castor oil and quinine in 63 per cent, castor oil and pituitrin in 69 per cent, castor oil, quinine, and pituitrin in 73 per cent and bag insertion in 95 per cent. Stripping of the membranes markedly increased the percentage of success in each group but also increased the morbidity. J. D. Barris¹²⁰ reports a series of 134 cases in which labor was induced for disproportion by means of a bougie or rubber tube. The fetal mortality was 12 per cent and there was one maternal death. (In this country induction of premature labor for cases where disproportion may arise, is uncommon.)

O. Panek¹²¹ reviewed the labors of 107 patients sixteen years of age or less. The average duration of labor was considerably less than the average for primiparas in general. Labor was premature in 27.1 per cent. M. Schulze¹²² found that the dangers and difficulties of labor in elderly primiparas have been exaggerated. Neither fetal nor maternal mortality is increased above the normal and the average duration of labor is only slightly prolonged. O. Linden¹²³ studied the labors of 202 primiparous patients over forty years of age. He found only 40 per cent required operative interference and only one patient had a cesarean section. There was no maternal mortality but 10.2 per cent of the infants died. On the other hand E. Essen-Möller¹²⁴ maintains that labor in a primipara over forty years of age is more dangerous for both mother and child. Cesarean section should be done in a certain proportion of these women. S. Kimura¹²⁵ found a maternal mortality of 3.1 per cent and a fetal death rate of 9.9 per cent in a series of 140 primiparas over thirty years of age. (It is important to distinguish an elderly primipara who has been married to a potent husband a long time, and had difficulty becoming pregnant, from one who married late in life and conceived soon afterward. The former will probably have dystocia but the latter not much more than younger women.)

For demonstrating the mechanism of labor, H. Thoms¹²⁶ uses the dried calvarium of an infant's skull which fits easily over the folded fingers. F. H. Bardenheuer¹²⁷ found that the Herrmannsdorfer diet aided obstetric patients regardless of whether the delivery was spontaneous or operative. The patients are given an acid diet which consists chiefly of meat, fish, eggs, butter, bread and starchy foods, cheese, etc., and they are forbidden to eat alkalies.

J. Jarcho¹²⁸ reviews the literature and states his own corroborative findings concerning the changes in the leucocytes during labor and the puerperium. The same author¹²⁹ discusses the rôle of posture in obstetrics. He found that the Walcher position increases the antero-posterior diameter of the inlet from 0.5 to 1.0 cm. and in certain cases may facilitate engagement of the fetal head. He¹³⁰ later verified this directly by measuring the true conjugate with the obstetric inclinometer. The latter instrument which was devised by J. B. Jacobs¹³¹ measures the obstetric diameters, the inclination of the pelvis as a whole and the angulation of the various planes. (It is unfortunate that posture during labor is being more and more neglected because a change in position occasionally results in a surprisingly favorable advance in progress.) A. C. Williamson¹³² describes a new obstetric bed the main feature of which is the rolling down of the complete bunk, with the mattress attached, escalator fashion.

Analgesia and Anesthesia.—According to F. J. Schoeneck¹³³ combined morphine, scopolamine, and rectal ether gives good results in 85 to 95 per cent of labor cases. L. A. Emge and C. L. Cooley¹³⁴ believe that the Gwathmey analgesia is a distinct advance in the relief of labor pains and C. E. Hunt,¹³⁵ who reviewed 120 answers to a questionnaire found that 86 per cent of those who answered were favorably impressed with the Gwathmey analgesia. G. W. Gustafson¹³⁶ reports a case of quinine reaction after rectal analgesia. C. J. Gauss¹³⁷ maintains that the combination of pernocton and scopolamine appears to be the best analgesic during labor. E. Vogt¹³⁸ says that pernocton is both a narcotic and a soporific. He has used this drug in about 1,000 cases and considers it the ideal drug in obstetrics. P. Goetz¹³⁹ likewise praises pernocton and L. Löfkovits¹⁴⁰ who also thinks highly of it suggests that it be used only by specialists. W. Hole¹⁴¹ agrees that pernocton is an efficient and rapid analgesic but points out that when the dose is excessive, the patients become excited and pains cease altogether for a while. R. Kobes¹⁴² found bromine and barbituric acid in the urine of babies born of mothers who had been given pernocton and he also found bromine in the umbilical cord blood and the liquor amnii but not in the maternal milk. A. R. Robbins, J. T. C. McCallum, A. M. Mendenhall and L. G. Zerfas¹⁴³ used sodium amytal in a number of obstetric cases and found that the most serious objection to this drug was the difficulty in controlling the patients who became very restless. Labor was rendered practically painless and no harm was observed. E. and T. Better¹⁴⁴ recommend somnifène intravenously for the alleviation of pain during labor. (Pernocton is a bromine-barbituric acid combination and because it has a tendency to produce marked excitation, it should be used only in hospitals.)

R. Peterson¹⁴⁵ reports an explosion of ethylene gas which resulted in the death of a mother and her child. He believes it is best to return to the use of ether and nitrous oxide gas, because, in spite of all precautions with ethylene, explosions are possible from within the gas machine as it is at present built.

Spinal anesthesia is highly recommended by G. P. Pitkin¹⁴⁶ for patients with complications of pregnancy where inhalation anesthesia is contraindicated. S. Tassovatz¹⁴⁷ used spinal anesthesia in 56 cervical cesarean sections and obtained good results in 50 cases. J. L. Audebert and E. Estienny¹⁴⁸ found that in cases of forceps operations, spinal anesthesia gave good results but that in breech extractions the

perineum is in great danger of being lacerated. J. R. Henry and L. Jaur¹⁴⁹ maintain that epidural anesthesia brings about painless labor while J. W. Kelso¹⁵⁰ unqualifiedly condemns caudal anesthesia for spontaneous deliveries. L. Portes¹⁵¹ reports seven cases in which he performed abdominal corporeal hysterotomy under local anesthesia. (Direct infiltration is much safer and just as efficient as spinal anesthesia for most obstetric operations. Episiotomy, forceps operation, cesarean sections and Porro operations can be performed with great ease under direct infiltration anesthesia.)

Complications.—I. Wilens¹⁵² emphasizes that the uteropubic fascia is an infrequent and not commonly recognized cause of dystocia. P. Findley¹⁵³ reviews the literature on acute puerperal inversion of the uterus and reports three cases which he saw in consultation. Findley advocates vaginal hysterectomy where vaginal replacement fails. On the other hand, L. E. Phaneuf¹⁵⁴ who treated three cases of complete inversion in four years advises laparotomy and correction by taxis when manual reposition fails. F. S. Kellogg¹⁵⁵ offers the following classification for inversion of the uterus: (1) Acute inversion when it is discovered before cervical ring formation. This is treated by immediate manual replacement from below. (2) Subacute inversion when it is discovered after cervical ring formation. The treatment for this is abdominal replacement by the Huntington technic. (3) Chronic inversion best corrected by a Spinelli type of operation from below.

Only eight cases of circular constriction of the fetal head were found in the literature by M. Oing¹⁵⁶ and she reports an additional case. She believes that primary rigidity and not a spastic muscular contraction of the cervix is responsible for these cases. J. P. Greenhill¹⁵⁷ answers Oing by citing his case of constriction of one thigh of a child by the cervix after the head and torso had been delivered. According to Greenhill, his case demonstrates that a true spasm of the cervix though extremely rare, can nevertheless occur.

A. M. Mendenhall¹⁵⁸ reviewed the literature on pituitary solution as a cause of rupture of the uterus and found a mortality of 78 per cent in 64 reported cases. (Not all such cases have been reported.) He believes that pituitary solution is valuable for postpartum hemorrhage, probably safe in the third stage of labor and for induction of labor if used cautiously, never safe in the first stage and rarely if ever safe in the second stage. H. E. Scheyer¹⁵⁹ reports five cases of spontaneous and seven cases of violent uterine rupture. He believes that extirpation of the uterus is not the treatment of choice, for in some cases the uterus may be left with impunity. L. S. Schwartz¹⁶⁰ operated upon four cases of perforation of the uterus and two of rupture of the uterus. In five of these cases conservative surgery was practiced and the patients recovered and have retained their menstrual and generative functions. Laffont and Larribère¹⁶¹ report 18 ruptures of the uterus among 6,500 confinements in the Algerian Maternity. L. M. Randall¹⁶² advocates the intravenous infusion of solution of acacia for shock in obstetrics because acacia fulfills all the requirements for intravenous treatment of shock except furnishing erythrocytes. A. Mandelstamm¹⁶³ discusses not only obstetric shock but also sudden death after labor. This author believes that the cause of obstetric shock is a disproportionate distribution of blood which causes an enormous amount of blood to remain stagnant in the abdomen. (There are many factors which tend to favor shock and among them are a long

and painful labor, dehydration, absence of rest and insomnia, fear, prolonged inhalation anesthesia, trauma, pituitrin and hemorrhage. All of these can be avoided.)

Operative Obstetrics.—W. J. Blevins¹⁶⁴ describes his method of repairing an episiotomy, N. H. Williams¹⁶⁵ advocates repair of the cervix on the ninth day postpartum, and W. O. Klein¹⁶⁶ discusses the suture of fresh perineal lacerations and episiotomies under local anesthesia. (There are many advantages in using local anesthesia. The usual risks of a general anesthetic are avoided, the field of operation is bloodless hence the repair can be performed with speed and accuracy, the scantiness of blood in the field is conducive to healing and there is no necessity to depend upon another individual for assistance.)

J. L. Baer¹⁶⁷ takes up the indications for and the technic of performing forceps operations and E. L. Cornell¹⁶⁸ discusses the technic of breech delivery. E. B. Piper and C. Bachman¹⁶⁹ reduce the factors which make for mortality in breech cases to compression of the cord, occurrence of a nuchal arm and difficulty in the birth of the after-coming head. Among 256 breech cases analyzed by W. E. Caldwell and W. E. Studdiford¹⁷⁰ there was a fetal mortality of 14 per cent and the policy was "hands off" as long as labor was progressing. At the Strasbourg clinic among 378 breech deliveries there was a maternal mortality of 1.08 per cent and a total fetal death rate of 20.1 per cent (F. Gateaux¹⁷¹). (In delivering a breech it is best to interfere only when necessary, take plenty of time, use green soap for lubrication, avoid excessive traction and use forceps on the after-coming head if difficulty is encountered.)

E. L. King and A. H. Gladden¹⁷² believe it is advisable to attempt to turn breech babies because among their 158 breech deliveries the fetal mortality was 10.1 per cent. G. Petrone¹⁷³ is likewise in favor of external version because in his series of 154 cases there was a death rate of 12 per cent for the living infants. H. Naujoks¹⁷⁴ reports a case of fatal intracranial hemorrhage in a newborn child as a result of external version. (External cephalic version should be practiced in all breech cases from the thirty-second week to term but only with gentleness and with constant control of the fetal heart tones. The Trendelenburg position sometimes helps.)

In a series of 100 versions performed according to the Potter technic, W. T. McConnell¹⁷⁵ had a fetal mortality of 15 per cent but only 2 per cent are attributed to the method. The author rightly insists that this operation should be performed only by an expert. At the Charité in Berlin prolapse of the cord occurred 182 times among 26,131 labors (0.7 per cent). The maternal mortality was 2.2 per cent and the fetal death rate was 46.7 per cent. Reposition of the cord had a mortality of 66.6 per cent whereas immediate delivery had a death rate of 14.3 per cent (E. Brandis¹⁷⁶).

The French literature last year contained a large number of articles on the Delmas method. (There are three features to this procedure: First, spinal anesthesia is used, second, the cervix is dilated manually within a few minutes, and third, the child is delivered by forceps or version and extraction.) The originator himself¹⁷⁷ reviews one year's experience with the procedure and extols it. Among his forty cases, one mother died from sepsis. Eight babies died but only two deaths can be blamed on the method of delivery. V. Le Lorier¹⁷⁸ admits that the Delmas method permits manual dilatation of the cervix but

it should be reserved for strict indications and P. Balard and E. Lacquièze¹⁷⁹ point out its dangers. Metzger,¹⁸⁰ Favreau¹⁸¹ and Mahon¹⁸² consider this procedure dangerous whereas J. C. de Carrera¹⁸³ and Guérin-Valmale and Verdeuil¹⁸⁴ believe it is excellent for cases of placenta previa. Cases where the Delmas method was used are reported by many authors.^{185, 186, 187, 188, 189, 190} (The Delmas method is accouchement forcé and is not without danger even in experienced hands.)

C. J. Miller¹⁹¹ points out the dangers connected with cesarean section. He properly emphasizes that the mortality of the average operator and the average mortality of all operators are much truer indices of the value of a given procedure than are the brilliant results of a single skillful surgeon or a single well-organized clinic.

In 1927 M. Hirsch¹⁹² of Berlin on the basis of statistics made a plea for an increase in the incidence of cesarean section and this started a flood of papers on the subject. The most important is that of Winter¹⁹³ who received information from 384 operators concerning 4,450 cesarean operations performed in Germany during 1928. The total maternal mortality was 7.1 per cent. Among 3,554 cervical operations the death rate was 3.7 per cent, for 438 classic operations it was 6.4 per cent, among 304 extraperitoneal operations it was 6.7 per cent and it was the same for 120 Porro operations. Winter believes that his analysis clearly shows that Hirsch's plea is based upon wrong premises. In a series of 450 cesarean sections R. Hornung¹⁹⁴ reports a maternal mortality of 4.2 per cent whereas among 695 vaginal operations it was 1.7 per cent. C. J. Gauss and v. Ammon¹⁹⁵ found that among 17,071 cesarean sections the total mortality was 5.8 per cent. It was lowest for the transperitoneal cervical operations. A series of 941 pregnancies after cesarean section were reported by 23 authors and the incidence of rupture of the uterus was 1.8 per cent, abortion occurred in 7.9 per cent and repeated cesarean section was done in 57.5 per cent. E. Martin and K. Spieckhoff¹⁹⁶ report a maternal mortality of 4.4 per cent for 405 abdominal deliveries and a mortality of 3.5 per cent for 1,114 vaginal operations. H. Krukenberg and H. Bodewig¹⁹⁷ found a death rate of 10.3 per cent among 426 cesarean sections and the best results were obtained with the cervical operation. In a series of 280 cases, H. Schroeder¹⁹⁸ records a mortality of 5 per cent. R. König¹⁹⁹ also disagrees with Hirsch and advocates in place of cesarean section, manual dilatation of the cervix and hypodermics of pituitrin during labor. H. Nevermann²⁰⁰ and also H. Albrecht²⁰¹ are others who appose Hirsch. On the other hand, A. Hessler²⁰² reports a series of 113 cesarean sections without a maternal death and H. Dörfler²⁰³ also makes a plea in favor of Hirsch's idea.

In America we have likewise had analyses of cesarean section statistics. J. C. Hirst²⁰⁴ reports 84 operations with two deaths and favors the Kerr operation. C. B. Lull²⁰⁵ reports a maternal mortality of 6.4 per cent for 109 operations, and E. M. Hawks²⁰⁶ found a death rate of 3.6 per cent in a series of 582 operations. Among 79 cases mostly contaminated and operated upon by the newer types of cesarean section no death occurred. O. P. Humpstone²⁰⁷ reports a mortality of 4.3 per cent for his series of cases. N. Davis²⁰⁸ informs us that in the city of Houston among 51 cesarean operations performed by recognized surgeons and physicians, the maternal mortality was 33 per cent whereas among 56 cesarean sections performed by obstetricians the death rate was only 1.8 per cent. E. B. Piper and C. Bachman²⁰⁹ make a compari-

son of the corporeal and cervical operations and they recommend a special type of corporeal operation which has given them practically as good results as the cervical operations. In J. K. Quigley's²¹⁰ series of 165 cesarean sections the total mortality was 1.2 per cent, but there were no deaths for the 61 laparotrachelotomies.

H. W. Mayes²¹¹ is enthusiastic about the use of mercurochrome as a vaginal antiseptic before cesarean section and A. C. Beck²¹² describes an improved technic of the two flap, low incision, cesarean section.

J. P. Greenhill and B. Bloom²¹³ report a histologic study of uterine scars after cervical cesarean section. They studied 37 pieces of tissue removed at the time of repeated cervical cesarean sections from the site of the previous incision. In some cases the wound had healed so perfectly that no scar tissue could be found whereas in others, the scars were so thin that from an anatomic point of view it would seem almost certain that they could not stand a test of labor. Nevertheless, two of five such scars did stand this test. (The above staggering array of figures indicates that too many cesarean sections are being done. This helps to keep up the high maternal mortality which is by no means indigenous to the United States. The statistics quoted unquestionably bear out the fact that the cervical cesarean section is far superior to all the other types and the almost routine use of local anesthesia will make it still safer. Cesarean sections should be performed whenever possible by specialists and not by general surgeons and practitioners. Occasionally the proper thing to do is a craniotomy and not a cesarean section. However, some men place such a high value on the child's life even though the child is dying, that they forget there is such an operation as craniotomy and they cause the woman's death by doing a cesarean section. At the Chicago Lying-In Hospital during the last fourteen years among 874 cervical operations, more than half of which were performed under local anesthesia, the maternal mortality was 1.26 per cent.)

D. A. Horner²¹⁴ reports three cases of bursting of the abdominal wound after cesarean section and he takes up the treatment of this condition. K. Kaiser²¹⁵ reports such a case also.

Uterine Hemorrhage.—L. A. Calkins²¹⁶ found that the age of the mother and parity have no effect on the amount of blood lost in the third stage of labor. S. Szenteh²¹⁷ administered calcium intravenously in 40 cases of postpartum hemorrhage and the results were excellent. F. H. Bardenheuer²¹⁸ maintains that if calcium is injected intramuscularly one or more hours before labor, the amount of blood lost in the third stage will be reduced about one third. L. Devraigne and M. Mayer²¹⁹ successfully treated four cases of severe hemorrhage by intravenous injections of citrated serum. M. Leff²²⁰ says that the placenta separates promptly after the birth of the child and the only possible way to find this out is to make a vaginal examination. (The routine use of vaginal examination by unskilled individuals for the determination of placental separation will undoubtedly lead to serious consequences.)

In a series of 65 cases of placenta previa, H. C. Williamson²²¹ reports a maternal mortality of 7.7 per cent and a fetal death rate of 47.7 per cent. Thirty-one patients were treated by colpeurynter, version and extraction and packing and five by cesarean section. F. H. Lacey²²² analyzed the records of 562 cases of placenta previa and the maternal mortality for the various methods of treatment was as follows: rupture

of membranes (126 cases) 2.3 per cent, natural forces (76 cases) 2.6 per cent, external version (28 cases) 3.5 per cent, internal version (228 cases) 7.4 per cent, internal version and extraction (17 cases) 17.6 per cent and cesarean section (33 cases) 6 per cent. At the Strasbourg clinic, A. Ginglinger and S. Assovatz²²³ inform us, during the last ten years, the treatment of placenta previa has varied from delivery from below to the classic cesarean section and finally to the cervical operation. B. Solomons²²⁴ found that in the last 55 cases treated at the Rotunda there was no maternal death. (The reviewer believes that most primiparas with placenta previa and most multiparas with central placenta previa should be delivered by the cervical cesarean section. Multiparas with lesser degrees of placenta previa and without much blood loss should be treated by more conservative means. When delivery is accomplished vaginally, it must be done very slowly. Saline and blood transfusions should be given where necessary. All patients with placenta previa should be sent to a hospital.) R. A. Bartholomew²²⁵ discovered toxemia 33 times among 61 patients who had abruptio placentae. He believes that induction of labor, watchful expectancy, stimulation and supportive therapy offer the best prognosis. According to A. A. Blagodarow²²⁶ there are in the literature only 40 cases of placenta accreta and he reports an additional case.

PUERPERIUM

General.—According to F. B. Smith,²²⁷ the salient features in the care of the breasts are cleanliness, support, alertness on the part of the physician and avoidance of trauma. He recommends sodium hypochlorite solution as a breast antiseptic. To increase the secretion of milk, M. Wachtel²²⁸ recommends the use of sun lamps and to suppress the flow he suggests thyroid medication. Among 500 puerperal women H. O. Neumann and M. Oing²²⁹ found that 6.8 per cent had supernumerary breasts or nipples.

J. Jarcho²³⁰ found substantial agreement in the Wassermann reaction in the blood and milk in 95 per cent of 107 patients. Blood examinations made on 25 afebrile patients by E. Kulka²³¹ revealed that the white cell count rose as high as 18,000 before labor and became normal by the fourth day postpartum. Immediately after delivery the count went as high as 29,000 and this is attributed to invasion of the blood stream by bacteria. The same author²³² examined the blood of 40 patients immediately after labor regardless of whether or not they had fever and he obtained positive blood cultures in 7 cases (17.5 per cent). G. Klapsia²³³ found bacteria in the blood within three or four hours after labor in nearly all afebrile cases, but after twenty-four hours fewer blood cultures were positive. (Postpartum chills are most likely due to bacteremia.)

Sepsis.—In a series of 2,016 deliveries reported by C. A. Gordon²³⁴ in which there was no preparation of the vagina, the morbidity was 3.6 per cent, and D. Kuperstein²³⁵ found that iodine externally employed compared well with mercurochrome even when the latter is applied both externally and in the vagina. M. S. Tansinsin²³⁶ reports a morbidity of 19.9 per cent for 446 labor cases. (We need a uniform standard of morbidity in this country.)

J. Hofbauer²³⁷ found that he can stimulate the bone marrow in puerperal women by means of pituitary solution followed by intravenous administration of hypertonic glucose solution.

In Massachusetts during 1928 there were 456 deaths in the puerperal state of which 27 per cent were due to sepsis.²³⁸ C. Jeannin and M. Sureau²³⁹ found that among every 1,000 women who give birth, 25 develop puerperal infection and six of the 1,000 die but only 2 deaths are due to sepsis. It is the belief of Albert²⁴⁰ that up to the fourth or fifth month of gestation, almost every uterus contains bacteria and this condition gradually subsides until at the time of labor only 50 per cent of the uteri have what the author terms "latent infection." The author believes that the following conditions may be attributed to latent infection of the uterus: eclampsia, spontaneous febrile abortion and premature labor, anomalies of the placenta and frequently intra-uterine death of the fetus. (There are many truths in this article.) F. L. Adair and L. J. Tiber²⁴¹ found among 8,000 patients that those who had scarlet fever in childhood had a lower incidence of puerperal infection than those who did not have this childhood disease. This is probably due to the fact that women who previously had a streptococcus infection are less liable to a morbid puerperium. M. Salmond and B. Turner²⁴² saw no significant difference between Dick-positive and Dick-negative pregnant women as regards fever during the puerperium. In a series of 113 cases of puerperal infection J. W. Harris and J. H. Brown²⁴³ found streptococci in the uterine cavity in 67 per cent. Aerobic and anerobic streptococci were found with about equal frequency.

A new concentrated streptococcus antitoxin was given by A. F. Lash²⁴⁴ to 57 women in various stages of puerperal infection and the mortality was 32 per cent. In a control series the death rate was 61 per cent. In another paper Lash²⁴⁵ reports a series of 1,261 puerperal women who were vaccinated with streptococcus vaccine and the incidence of puerperal fever was 0.87 per cent as contrasted with 2.8 per cent for an unvaccinated series. G. Gibson²⁴⁶ treated postpartum infection by subcutaneous injection of blood and among 23 patients 3 died. J. Wozak²⁴⁷ used the Warnekros serum in 25 patients and he noticed only slight benefit. H. Küstner²⁴⁸ advocates the use of grape sugar and Ringer solution in combination with serum therapy for puerperal sepsis. For the same condition J. B. Bernstine²⁴⁹ recommends intravenous metaphen, Devraigne, Sauphar and Mayer²⁵⁰ and also Audebert and Estienny²⁵¹ advocate intravenous injections of aseptic pus. Le Lorier²⁵² extols intravenous novarsenol, P. Oginz²⁵³ favors intravenous rivanol and S. S. Rosenfeld²⁵⁴ recommends the application of neutral acriflavine into the uterine cavity for the prophylactic treatment of puerperal infection. J. Audebert and J. B. Giscard²⁵⁵ praise the use of auto-vaccinotherapy in gonorrheal infection during the puerperium.

Among 90 cases of sepsis studied by C. Clauberg and H. Kötter,²⁵⁶ 26 followed labor and 64 occurred after abortion. The death rate was 87.5 per cent for the abortion group and 61.5 per cent for the labor series. In the 67 autopsies performed, it was found that the greatest source for the origin and spread of infection was the parametrium. I. v. Büben²⁵⁷ reports three fatal cases of tonsillitis during pregnancy and labor, Rhenter and Savoye²⁵⁸ record nine cases of typhoid fever during the puerperal state and L. Devraigne, L. Baize and M. Mayer²⁵⁹ report six cases of puerperal scarlet fever.

N. Ellerbroek²⁶⁰ reports three cases of puerperal gangrene where ergot was used but denies there is any danger of gangrene if ergot

preparations are given in proper doses. H. Saenger²⁶¹ found 13 cases of gangrene which followed the use of gynergen (ergotamin tartrate) in the literature. All the patients had sepsis, and he explains the gangrene on the basis of infectious-toxic changes in the blood vessels. Puerperal gangrene without septic infection does not appear to occur because huge doses of ergotamin are necessary to produce gangrene. H. Guggisberg²⁶² agrees with Saenger. W. Uter²⁶³ reviewed the literature on gynergen and he outlines his indications for the use of this drug. (Gynergen is one of the best hypodermic preparations of ergot.)

THE NEWBORN

Physiology.—H. and R. M. Bakwin²⁶⁴ found that newborn infants lost considerably more weight during the winter than during the summer and they had fever more often during the winter. K. Sugiura²⁶⁵ found a relationship between the seasons of the year and the sex of children born in Japan. M. T. Macklin²⁶⁶ collected from the literature 1,600 cases with which she refutes Still's theory that primogeniture, as such, plays a large part in the production of developmental defects.

C. Holtermann²⁶⁷ points out that fetal arrhythmia in overterm children is an early symptom of impending death. The practical significance of this observation is that the child should be delivered without delay as soon as the irregularity is found, but it is advisable to wait until the irregularity has been observed at least twice. A. Mathieu and A. Holman²⁶⁸ discuss resuscitation of the asphyxiated newborn, and they recommend the use of the tracheal catheter after the air passages are cleared of foreign material. (The tracheal catheter is the simplest and most efficient means of resuscitating a baby.)

Complications.—W. C. Danforth²⁶⁹ discusses neonatal mortality and he considers measures for decreasing this. A. Couvelaire²⁷⁰ informs us that at the Baudeloque clinic there were 45 fetal deaths for every 1,000 births and of these 14 occurred during pregnancy, 19 during labor, and 12 during the first three days of life. This mortality is being decreased by antisiphilitic treatment and by the prevention and treatment of pregnancy toxemias.

J. C. Douglas and V. Stone²⁷¹ discuss the prevention of ophthalmia neonatorum. E. Kellert²⁷² controlled impetigo neonatorum by using 50 to 60 per cent glycerin, and E. T. Rulison²⁷³ checked impetigo by changing the nursing supervision of the babies. H. Ehrenfest²⁷⁴ discusses the ever-timely question of intracranial birth injuries. He says "The physiologic traumatization of the brain and meninges in labor can be reduced to its possible minimum by absolute nonintervention during labor that is progressing normally, excepting in this respect an episiotomy and truly perineal forceps applied to a maximally compressed head. If, in the interest of either the mother or the child, intervention is considered necessary, haste almost invariably will increase the danger of the child. Serious harm will be obviated if the seemingly asphyxiated child is always considered as probably having been intracranially traumatized." H. Yagi²⁷⁵ found intracranial hemorrhage in 34.3 per cent out of 178 autopsies on stillbirths. The same author²⁷⁶ advocates the use of barium sulphate injections followed by x-ray pictures for the detection of intracranial hemorrhage. M. F. Eades²⁷⁷ found that operative deliveries, especially forceps, play a major rôle in the causation of retinal hemorrhages but the latter are not

constant in cases of intracranial injury. P. L. Schroeder²⁷⁸ discusses the behavior difficulties in children associated with results of birth trauma.

It was found by M. Lange²⁷⁹ that 3 per cent of the patients who entered a large orthopedic clinic had deformities which could be traced to an obstetric trauma and that 50 per cent of these cripples are incurable. B. Hukewytsh²⁸⁰ emphasizes that fracture of the clavicle in spontaneous deliveries of head presentations occurs more frequently than it is diagnosed. However, it heals quickly and without functional disturbances.

In a series of 765 patients in whom quinine was used to induce labor, W. J. Dilling²⁸¹ believes the drug may have been responsible for eight stillbirths (1.04 per cent). J. R. McCord²⁸² reports an interesting study of 200 autopsies made on syphilitic babies. He maintains that syphilis is only transmitted to the baby by way of the placenta and that the lesions of the long bones as demonstrated by the roentgen-ray are pathognomonic of fetal syphilis. Even moderate antisymphilitic treatment during pregnancy will save a majority of the babies. F. Gereken²⁸³ points out that patients with syphilis must be treated during pregnancy regardless of whether they were treated before pregnancy. P. P. Müller²⁸⁴ reviews the literature on defects of the scalp in the newborn which are due to syphilitic infection during labor.

A very extensive and valuable series of articles have been written individually and together by L. Goldstein and D. P. Murphy.²⁸⁵ They collected all available data on the effect of both preconceptional and postconceptional radiation on the mother and on the newborn, and they performed animal experiments as well. They found that irradiation during pregnancy is fraught with great danger to the child because many defective children are the result. An unusually large proportion of these children have microcephalus. On the other hand "there is as yet no definite indication that ovarian irradiation prior to fertilization has any detrimental influence upon the health or development of any subsequent children." Pregnancy may occur during a period of amenorrhea between roentgen exposures and subsequent treatment may damage the embryo. P. Toombs²⁸⁶ emphasizes that diagnostic exposure of x-ray is not harmful unless it is repeated too frequently but therapeutic exposure causes abortion and deformities of the fetus. F. Unterberger²⁸⁷ reports a roentgen-ray injury to a fetus due to repeated fluoroscopic examinations during pregnancy.

THE PLACENTA

G. B. Wislocki and C. G. Hartman²⁸⁸ found that the blood which constitutes the placental sign in the macaque monkey comes from uterine glands which are distended with extravasated maternal blood. H. Thoms²⁸⁹ reports an unusual roentgenographic study of placental infarcts and P. Kiffner²⁹⁰ maintains that for the demonstration of vascular connections in twin placentas stereoscopic x-ray plates after the injection of an opaque substance are more reliable than ordinary plates.

G. Frommolt²⁹¹ comes to the conclusion that the decidua with its maternal blood vessels does not extend up between the chorionic villi in the placenta until actual separation of the placenta takes place. Hence the furrows between the cotyledons (decidual septa) are not preformed but arise during the last stage of labor. It is the belief of

R. Kobes²⁹² and also of J. Putz²⁹³ that an intact placenta always floats horizontally but the converse is not true. E. Philipp²⁹⁴ points out that spirochetes go through the placenta and without producing any tissue damage whereas streptococci traverse the placenta only after destruction of the villous epithelium. The human placenta is a distinct protection against infection of the fetus, but this is not true of all diseases. F. L. Adair and R. E. McDonald²⁹⁵ reviewed the literature on varix of the umbilical cord and they report a case.

MISCELLANEOUS

A strong and logical plea is made by E. D. Plass²⁹⁶ for the simplification of obstetric care. Among the essentials necessary to obtain better medical care for women patients, C. H. Davis²⁹⁷ considers governmental activities directed toward a survey of the causes of maternal and infant deaths, and more institutions in which physicians who specialize in obstetrics and gynecology may obtain the necessary training. A. M. Mendenhall²⁹⁸ emphasizes that our students are graduating with little worth-while training in obstetric surgery and that opportunities for postgraduate study are insufficient to supply the demand. F. W. Rice²⁹⁹ likewise sees room for improvement in the teaching of obstetrics but includes the training of nurses and midwives in his program.

According to M. Nicoll,³⁰⁰ in the registration area for 1927, 19,837 women died from causes directly connected with childbirth. He says "before permitting ourselves to indulge in too violent self-condemnation let us be certain that the figures of other countries are as accurate as ours and based on identical methods of allocating causes of death. . . . No nation except ours is called upon to face such a racial variation in fitness for motherhood." O. N. Eastman³⁰¹ found that among 489 maternal deaths in Vermont, one-third were due to albuminuria and convulsions, one-fourth to sepsis, and one-fifth to hemorrhage. G. F. Gibberd³⁰² points out that in England the maternal mortality rate in the last sixty years has fallen from 4.4 per 1,000 to 1.03 per 1,000 and this can be traced to changes in obstetric methods. J. O. Polak assisted by C. Clark³⁰³ emphasizes that the mortality directly attributable to childbirth is largely preventable. Childbirth can be made safer by the intelligent application of the physiologic mechanism of labor and adherence to strict surgical technic. In the presence of complicating diseases the pregnancy in most instances can be disregarded and attention given to the treatment of the disease. R. W. Holmes, R. D. Mussey and F. L. Adair³⁰⁴ agree that the most important factor in the lowering of our death rate is provision of suitable institutions and of a well-trained personnel to provide proper care for the mother during pregnancy, labor, and the puerperium. The laymen must be educated to the dangers of abortion, toxemias, and infection, and they must realize the importance of good care during pregnancy, labor, and the puerperium.

According to J. P. Kinloch³⁰⁵ the maternal death rate in Scotland for 1928 was 70 per 10,000 births and 24 of these were due to sepsis. He quotes the Aberdeen report which shows that during a ten year period the death rate per 10,000 maternity cases was 28 in the practice of midwives, 69 for the doctors, and 149 in hospital practice. All of the deaths were transferred back to the original doctor or midwife in charge of the case. The view is advanced that the higher incidence of puerperal sepsis in the practice of doctors as contrasted with that of

midwives, is due in part to a streptococcus carrier condition in doctors. (This is undoubtedly true.) If the risks of contagion in maternity hospitals is to be restricted, then the number of patients and their spacing in the wards must be rigorously controlled. M. Rosensohn³⁰⁶ informs us that at the New York Lying-In Hospital there were 25 maternal deaths among 5,001 patients. There were 164 cesarean sections with a death rate of 2.4 per cent. According to J. Lal Das,³⁰⁷ about 20,000 women die during pregnancy and labor in India each year because in certain provinces most mothers do not receive any skilled attention.

REFERENCES

- (110) *Kreis, J.*: Bull. Soc. d'obst. et de Gynéc. 18: 78, 1929. (111) *Frey, E.*: Schweiz. med. Wehnschr. 59: 613, 1929, and Ztschr. f. Geburtsh. u. Gynäk. 96: 468, 1928 (with A. Fehr). (112) *Philipp, E.*: Zentralbl. f. Gynäk. 53: 1618, 1929. (113) *Schulze, M.*: AM. J. OBST. & GYNEC. 17: 20, 1929. (114) *Stein, A.*: New York State J. M. 29: 810, 1929. (115) *Widera, M.*: Zentralbl. f. Gynäk. 53: 403, 1929. (116) *Demuth, F.*: Ibid. 53: 403, 1929. (117) *Jackson, D. L.*: Am. J. Surg. 7: 389, 1929. (118) *Morton, D. G.*: AM. J. OBST. & GYNEC. 18: 849, 1929. (119) *Reis, R.*: Ibid. 17: 392, 1929. (120) *Barris, J. D.*: J. Obst. & Gynec. Brit. Emp. 36: 287, 1929. (121) *Panck, O.*: Med. Klin. 25: 376, 1929. (122) *Schulze, M.*: J. A. M. A. 93: 824, 1929. (123) *Linden, O.*: Acta Obst. et Gynec. Scandinav. 8: 35, 1929. (124) *Essen-Möller, E.*: Ibid. 8: 103, 1929. (125) *Kimura, S.*: Jap. J. Obst. & Gynec. 12: 161, 1929. (126) *Thoms, H.*: AM. J. OBST. & GYNEC. 18: 127, 1929. (127) *Bardenheuer, F. H.*: München. med. Wehnschr. 76: 1205, 1929. (128) *Jarcho, J.*: AM. J. OBST. & GYNEC. 17: 13, 1929. (129) *Jarcho, J.*: Surg. Gynec. Obst. 48: 257, 1929. (130) *Jarcho, J.*: Ibid. 49: 854, 1929. (131) *Jacobs, J. B.*: Southern M. J. 22: 321, 1929. (132) *Williamson, A. C.*: AM. J. OBST. & GYNEC. 17: 875, 1929. (133) *Schoeneck, F. J.*: New York State J. M. 29: 1273, 1929. (134) *Emge, L. A., and Cooley, C. L.*: California & West. Med. 31: 195, 1929. (135) *Hunt, C. E.*: Northwest Med. 28: 82, 1929. (136) *Gustafson, G. W.*: AM. J. OBST. & GYNEC. 18: 877, 1929. (137) *Gauss, C. J.*: Deutsche med. Wehnschr. 55: 1, 1929. (138) *Vogt, E.*: Der Schmerz, May-June, 1929. (139) *Goetz, P.*: Zentralbl. f. Gynäk. 53: 874, 1929. (140) *Löfkovits, L.*: Ibid. 53: 142, 1929. (141) *Hole, W.*: Ibid. 53: 974, 1929. (142) *Kobes, R.*: Ibid. 53: 42, 1929. (143) *Robbins, A. R., McCallum, J. T. C., Mendenhall, A. M., and Zerkas, L. G.*: AM. J. OBST. & GYNEC. 18: 406, 1929. (144) *Better, E. and T.*: Zentralbl. f. Gynäk. 53: 1632, 1929. (145) *Peterson, R.*: AM. J. OBST. & GYNEC. 18: 65, 1929. (146) *Pitkin, G. P.*: Ibid. 18: 165, 1929. (147) *Tassovatz, S.*: Revue franç. de gynéc. et d'obst. 24: 350, 1929. (148) *Audebert, J. L., and Estienne, E.*: Bull. Soc. d'obst. et de gynéc. 18: 98, 1929. (149) *Henry, J. R., and Jaur, L.*: Gynéc. et Obst. 19: 19, 1929. (150) *Kelso, J. W.*: AM. J. OBST. & GYNEC. 18: 416, 1929. (151) *Portes, L.*: Gynéc. et Obst. 20: 46, 1929. (152) *Wilens, I.*: AM. J. OBST. & GYNEC. 18: 94, 1929. (153) *Findley, P.*: Ibid. 18: 587, 1929. (154) *Phaneuf, L. E.*: Surg. Gynec. Obst. 48: 709, 1929. (155) *Kellogg, F. S.*: AM. J. OBST. & GYNEC. 18: 815, 1929. (156) *Oing, M.*: Zentralbl. f. Gynäk. 53: 150, 1929. (157) *Greenhill, J. P.*: Ibid. 53: 1316, 1929. (158) *Mendenhall, A. M.*: J. A. M. A. 92: 1341, 1929. (159) *Scheyer, H. E.*: München. med. Wehnschr. 76: 364, 1929. (160) *Schwartz, L. S.*: AM. J. OBST. & GYNEC. 17: 66, 1929. (161) *Laffont and Larribère*: Bull. Soc. d'obst. et de gynéc. 18: 413, 1929. (162) *Randall, L. M.*: J. A. M. A. 93: 845, 1929. (163) *Mandelstamm, A.*: Arch. f. Gynäk. 138: 543, 1929. (164) *Blevins, W. J.*: AM. J. OBST. & GYNEC. 17: 197, 1929. (165) *Williams, N. H.*: J. A. M. A. 93: 1040, 1929. (166) *Klein, W. O.*: München. med. Wehnschr. 76: 1124, 1929. (167) *Baer, J. L.*: Illinois M. J. 56: 376, 1929. (168) *Cornell, E. L.*: Surg. Gynec. Obst. 49: 367, 1929. (169) *Piper, E. B., and Bachman, C.*: J. A. M. A. 92: 217, 1929. (170) *Caldwell, E. W., and Studdiford, W. E.*: AM. J. OBST. & GYNEC. 18: 623, 1929. (171) *Gateaux, F.*: Gynécologie 28: 139, 1929. (172) *King, E. L., and Gladden, A. H.*: AM. J. OBST. & GYNEC. 17: 78, 1929. (173) *Petrone, G.*: Gynéc. et Obst. 19: 321, 1929. (174) *Naujoks, H.*: Zentralbl. f. Gynäk. 53: 270, 1929. (175) *McConnell, W. T.*: South. M. J. 22: 55, 1929. (176) *Brandis, E.*: Monatsschr. f. Geburtsh. u. Gynäk. 82: 208, 1929. (177) *Delmas, P.*: Rev. franç. de gynéc. et d'obst. 24: 193, 1929, and Bull. Soc. d'obst. et de gynéc. 18: 382, 1929. (178) *Le Lorier, V.*: Bull. Soc. d'obst. et de gynéc. 17: 903, 1929. (179) *Balard, P., and Lacquière, E.*: Rev. franç. de gynéc. et d'obst. 24: 283, 1929. (180) *Metzger*: Ibid. 24: 14, 1929.

- (181) Favreau: Bull. Soc. d'obst. et de gynéc. 18: 202, 1929. (182) Mahon: Ibid. 18: 202, 1929. (183) de Carrera, J. C.: Bull. Soc. d'obst. et de gynéc. 18: 377, 1929. (184) Guérin-Falmale and Verdeuil: Ibid. 18: 632, 1929. (185) Lapervenche: Ibid. 18: 201, 1929. (186) Faugère: Ibid. 18: 199, 1929. (187) Gautret: Ibid. 18: 215, 1929. (188) Gonnet and Imbret: Ibid. 18: 230, 1929. (189) Audebert and Estienny: Ibid. 18: 647, 1929. (190) Cathala, V.: Rev. franç. de gynéc. et de obst. 24: 20, 1929. (191) Miller, C. J.: Surg. Gynec. Obst. 48: 745, 1929. (192) Hirsch, M.: Zentralbl. f. Gynäk. 51: 2215, 1927. (193) Winter, G.: Ibid. 53: 1874, 1929. (194) Hornung, R.: München. med. Wehnschr. 76: 1586, 1929. (195) Gauss, C. J., and v. Ammon: Deutsche med. Wehnschr. 55: 817, 1929. (196) Martin, E., and Spieckhoff, K.: Monatschr. f. Geburtsh. u. Gynäk. 81: 154, 1929. (197) Krukenberg, H., and Bodewig, H.: Ibid. 83: 57, 1929. (198) Schroeder, H.: Ztschr. f. Geburtsh. u. Gynäk. 95: 328, 1929. (199) König, R.: Zentralbl. f. Gynäk. 53: 2032, 1929. (200) Neumann, H.: Deutsche med. Wehnschr. 55: 266, 1929. (201) Albrecht, H.: München. med. Wehnschr. 76: 834, 1929. (202) Hessler, A.: Ibid. 76: 101, 1929. (203) Dörfler, H.: Ibid. 76: 2, 1929, and 76: 283, 1929. (204) Hirst, J. C.: AM. J. OBST. & GYNEC. 18: 773, 1929. (205) Lull, C. B.: Ibid. 17: 403, 1929. (206) Hawks, E. M.: Ibid. 18: 393, 1929. (207) Humpstone, O. P.: Ibid. 17: 663, 1929. (208) Davis, N.: Texas State J. M. 24: 833, 1929. (209) Piper, E. B., and Bachman, C.: Surg. Gynec. Obst. 49: 547, 1929. (210) Quigley, J. K.: AM. J. OBST. & GYNEC. 17: 597, 1929. (211) Mayes, H. W.: Ibid. 17: 645, 1929. (212) Beck, A. C.: J. A. M. A. 92: 27, 1929. (213) Greenhill, J. P., and Bloom, B.: J. A. M. A. 92: 21, 1929. (214) Horner, D. A.: Ibid. 93: 1126, 1929. (215) Kaiser, K.: Monatschr. f. Geburtsh. u. Gynäk. 82: 322, 1929. (216) Calkins, L. A.: AM. J. OBST. & GYNEC. 17: 578, 1929. (217) Szentch, S.: Zentralbl. f. Gynäk. 53: 1828, 1929. (218) Bardenheuer, F. H.: Ibid. 53: 1826, 1929. (219) Devraigne, L., and Mayer, M.: Bull. Soc. d'obst. et de gynéc. 18: 466, 1929. (220) Leff, M.: AM. J. OBST. & GYNEC. 18: 868, 1929. (221) Williamson, H. C.: New York State J. M. 29: 936, 1929. (222) Lacey, F. H.: Brit. M. J. No. 3585, 527, 1929. (223) Gänglinger, A., and Assovatz, S.: Rev. franç. de gynéc. et d'obst. 24: 362, 1929. (224) Solomons, B.: Brit. M. J. No. 3585, 525, 1929. (225) Bartholomew, R. A.: AM. J. OBST. & GYNEC. 18: 818, 1929. (226) Blagodarow, A. A.: Zentralbl. f. Gynäk. 53: 2671, 1929. (227) Smith, F. B.: AM. J. OBST. & GYNEC. 18: 874, 1929. (228) Wachtel, M.: Zentralbl. f. Gynäk. 53: 987, 1929. (229) Neumann, H. O., and Oing, M.: Arch. f. Gynäk. 138: 494, 1929. (230) Jarcho, J.: J. Lab. & Clin. Med. 14: 1097, 1929. (231) Kulka, E.: Zentralbl. f. Gynäk. 53: 1395, 1929. (232) Kulka, E.: Ibid. 53: 202, 1929. (233) Klapsa, G.: Ibid. 53: 1397, 1929. (234) Gordon, C. A.: AM. J. OBST. & GYNEC. 18: 245, 1929. (235) Kuperstein, D.: Ibid. 17: 865, 1929. (236) Tansinsin, M. S.: Ibid. 18: 98, 1929. (237) Hofbauer, J.: Ibid. 17: 761, 1929. (238) New England J. M. 201: 470, 1929. (239) Jeannin, C., and Sureau M.: Bull. Soc. d'obst. et de gynéc. 18: 192, 1929. (240) Albert: Arch. f. Gynäk. 138: 148, 1929. (241) Adair, F. L., and Tiber, J. L.: AM. J. OBST. & GYNEC. 17: 559, 1929. (242) Salmond, M., and Turner, B.: Brit. M. J. 2: 145, 1929. (243) Harris, J. W., and Brown, J. H.: Bull. Johns Hopkins Hosp. 44: 1, 1929. (244) Lash, A. F.: AM. J. OBST. & GYNEC. 17: 297, 1929. (245) Lash, A. F.: Ibid. 18: 639, 1929. (246) Gibson, G.: New York State J. M. 29: 536, 1929. (247) Wozak, J.: Monatschr. f. Geburtsh. u. Gynäk. 81: 176, 1929. (248) Küstner, H.: Zentralbl. f. Gynäk. 53: 2962, 1929. (249) Bernstine, J. B.: AM. J. OBST. & GYNEC. 18: 220, 1929. (250) Devraigne, Sauphar, and Mayer: Bull. Soc. d'obst. et de gynéc. 18: 459, 1929. (251) Audebert and Estienny: Ibid. 18: 679, 1929. (252) Le Lorier, V.: Ibid. 18: 453, 1929. (253) Ogins, P.: AM. J. Surg. 7: 647, 1929. (254) Rosenfeld, S. S.: AM. J. OBST. & GYNEC. 17: 408, 1929. (255) Audebert J., and Giscard, J. B.: Rev. franç. de gynéc. et obst. 24: 145, 1929. (256) Clauberg, C., and Kötter, H.: Arch. f. Gynäk. 138: 469, 1929. (257) v. Büben, I.: Zentralbl. f. Gynäk. 53: 2428, 1929. (258) Rhenster and Savoye: Bull. Soc. d'obst. et de gynéc. 18: 242, 1929. (259) Devraigne, L., Baize, L., and Mayer, M.: Ibid. 18: 337, 1929. (260) Ellerbroek, N.: Zentralbl. f. Gynäk. 53: 1384, 1929. (261) Saenger, H.: Ibid. 53: 586, 1929. (262) Guggisberg, H.: Ibid. 53: 578, 1929. (263) Uter, W.: Ibid. 53: 1377, 1929. (264) Bakwin, H., and Bakwin, R. M.: AM. J. OBST. & GYNEC. 18: 863, 1929. (265) Sugiyura, K.: Jap. J. Obst. & Gynec. 12: 56, 1929. (266) Macklin, M. T.: Lancet 1: 971, 1929. (267) Holtermann, C.: Zentralbl. f. Gynäk. 53: 711, 1929. (268) Mathieu, A., and Holman, A.: J. A. M. A. 92: 1917, 1929. (269) Danforth, W. C.: Illinois M. J. 56: 166, 1929. (270) Couvelaire, A.: Gynéc. et Obst. 19: 477, 1929. (271) Douglas, J. C., and Stone, V.: Med. J. Australia 2: 262, 1929. (272) Kellert, E.: AM. J. OBST. & GYNEC. 18: 426, 1929. (273)

- Rulison, E. T.*: J. A. M. A. 93: 903, 1929. (274) *Ehrenfest, H.*: Ibid. 92: 97, 1929. (275) *Yagi, H.*: Jap. J. Obst. & Gynec. 12: 130, 1929. (276) *Yagi, H.*: Ibid. 12: 223, 1929. (277) *Eades, M. F.*: New England J. M. 201: 151, 1929. (278) *Schroeder, P. L.*: J. A. M. A. 92: 100, 1929. (279) *Lange, M.*: München. med. Wehnschr. 76: 1211, 1929. (280) *Hukewytsh, B.*: Monatschr. f. Geburtsh. u. Gynäk. 83: 25, 1929. (281) *Dilling, W. J.*: J. Obst. & Gynec. Brit. Emp. 36: 354, 1929. (282) *McCord, J. R.*: AM. J. OBST. & GYNEC. 18: 597, 1929. (283) *Gercken, F.*: Zentralbl. f. Gynäk. 53: 3044, 1929. (284) *Müller, P. P.*: Ibid. 53: 2795, 1929. (285) *Murphy, D. P., and Goldstein, L.*: AM. J. OBST. & GYNEC. 18: 179, 189, and 696, 1929; Surg. Gynec. Obst. 49: 440 and 804, 1929; Am. J. Roentgenol. & Radio Therap. 22: 207 and 322, 1929. (286) *Toombs, P.*: AM. J. OBST. & GYNEC. 17: 516, 1929. (287) *Unterberger, F.*: Zentralbl. f. Gynäk. 53: 44, 1929. (288) *Wislocki, G. B., and Hartman, C. G.*: Bull. Johns Hopkins Hosp. 44: 165, 1929. (289) *Thoms, H.*: AM. J. OBST. & GYNEC. 17: 176, 1929. (290) *Kiffner, P.*: Arch. f. Gynäk. 136: 111, 1929. (291) *Frommolt, G.*: Zentralbl. f. Gynäk. 53: 1025, 1929. (292) *Kobes, R.*: Ibid. 53: 790, 1929. (293) *Putz, J.*: Ibid. 53: 110, 1929. (294) *Philipp, E.*: Ztschr. f. Geburtsh. u. Gynäk. 95: 234, 1929. (295) *Adair, F. L., and McDonald, R. E.*: AM. J. OBST. & GYNEC. 17: 836, 1929. (296) *Plass, E. D.*: J. Iowa State M. A. 19: 158, 1929. (297) *Davis, C. H.*: J. A. M. A. 93: 961, 1929. (298) *Mendenhall, A. M.*: AM. J. OBST. & GYNEC. 17: 583, 1929. (299) *Rice, F. W.*: New York State J. M. 29: 262, 1929. (300) *Nicoll, M.*: Ibid. 29: 800, 1929. (301) *Eastman, O. N.*: New England J. M. 200: 1101, 1929. (302) *Gibberd, G. F.*: Lancet 217: 535, 1929. (303) *Polak, J. O., and Clark, C.*: J. A. M. A. 93: 1436, 1929. (304) *Holmes, R. W., Mussey, R. D., and Adair, F. L.*: J. A. M. A. 93: 1440, 1929. (305) *Kinloch, J. P.*: Brit. M. J. 2: 340, 1929. (306) *Rosensohn, M.*: Med. J. & Rec. 129: 517, 1929. (307) *Das, J. L.*: Indian M. Rec. 49: 33, 1929.

426 EAST FIFTY-FIRST STREET.

Selected Abstracts

Miscellaneous Abstracts

Warner, Allen: An Achondroplastic Twin. *British M. J.* 2: 983, 1928.

The case of an achondroplastic twin is reported. The twins were ten and one-half years old. The one weighed $7\frac{1}{2}$ pounds at birth; at present he has the height of a boy of fourteen years. The other twin also weighed $7\frac{1}{2}$ pounds at birth and at present has a height of $40\frac{1}{2}$ inches. He shows all the characteristics of achondroplasia.

Although these twins were of the same sex, they are so very different that it can be taken for granted they were developed from two distinct ova.

ADAIR-BRUSEGARD.

Witkin, W.: A Parasitic Fetus. *J. M. A. South Africa* 3: 252, 1929.

This is a report of a parasitic fetus attached to one of twins born by a para iii. The child or autosite was alive, weighed about 5 pounds, but was cyanotic and poorly developed. The parasite was attached to the thorax of the autosite near the xiphoid by a long pedicle so that the lower extremities were astride the autosite's abdomen. Heart, heart, lungs, and liver were entirely absent and the upper extremities were rudimentary. From the waist down it was well formed. The lower extremities were equal. It had a well formed penis through which urination occurred, but the anus was imperforate. No response of parasite could be elicited to skin irritation, but autosite responded. The child presented an umbilical hernia through which bowel protruded and for which it was operated upon the day following delivery. Recovery was uneventful except for some difficulty in keeping the wound dry of the parasite's urine. The child's general condition improved following this operation, but it later again went downhill so that when ten weeks old a second operation was performed to remove the parasite. Healing occurred with some slough. A month after the operation the child was still alive, taking the breast and having normal stools.

FRANK SPIELMAN.

Chatillon F.: Five Cases of Pseudocyesis. *Schweiz. med. Wchnschr.* 59: 530, 1929.

The author reports five cases offering the usual symptoms of enlargement of the abdomen, and all the concomitant symptoms of a pregnancy. As to cause, it seems important that two of the patients were approaching menopause and this disturbance is usual at that time. These patients usually have a persistent amenorrhea or scanty catamenia. There always exists a persistent desire for children. The background of the condition is probably ovarian in origin.

A. C. WILLIAMSON.

Laffont and Larribère: Twelve Cases Treated by a Modification of Henkel's Procedure. *Bull. Soc. d'obst. et de gynéc.* 9: 836, 1928.

The authors employed Henkel's method of clamping the uterine arteries through the vagina in twelve cases of severe postpartum hemorrhage. They used the usual clamping forceps instead of Museux clamps. Three patients died. The clamps

were left in place usually for two hours but in one instance for six. No urinary disturbances were noted and infection was observed only twice. Both of the latter patients had placenta previa. In all the cases the authors felt that the only other methods of choice were hysterectomy or tamponade.

J. P. GREENHILL

Shaw, Wilfred: A Case of Adenomyolipoma of the Fallopian Tube. J. Obst. & Gynec. Brit. Emp. 35: 725, 1928.

This is the fifth case of lipoma of the fallopian tube recorded and is remarkable in that a combined lipoma and adenomyoma was present. The tumor was found in a nulliparous woman of forty years of age, presenting irregular bleeding of several years' duration. It was about $\frac{3}{4}$ inch in diameter, and situated near the right cornu resembling a subperitoneal fibroid. Histologically it was a lipoma in the substance of which adenomyomatous tissue was present.

FRANK SPIELMAN.

Joachimovits, R.: Uterine Sounds Especially Ringing Uterine Noises. Monatsschr. f. Geburtsh. u. Gynäk. 81: 1, 1929.

In a few cases the uterine sounds are ringing or whistling and the ringing sounds are heard more frequently on the right side. The cause for this kind of sound is torsion of the uterus with resulting bending of the main blood vessels. Natural or artificial meteorism produced by the injection of air in the large intestines usually increases the intensity of the uterine sounds but does not make it ringing in quality. These sounds are heard through the abdomen only in human beings and in monkeys, but in most animals the sounds may be heard through the rectum. Generally the sounds are heard loudest on the side where the fetal heart tones are most distinct. During labor pains the sounds are weakened or inaudible.

J. P. GREENHILL

Vigholt, W.: Torsion of the Tube with Secondary Hematosalpinx. Acta. Obst. et Gynec. Scandinavica 7: 310, 1928.

The author reports a case in which there was torsion of a hematosalpinx in a seventeen-year-old unmarried woman. Histologic examination revealed hemorrhage not only in the lumen but also in the wall of the tube. No signs of inflammation or pregnancy could be detected. Of the 38 cases of uncomplicated torsion of the fallopian tube or adnexa reported in the literature, about three-fourths were of isolated torsion of the tube. In most cases the hematosalpinx was secondary to the torsion.

J. P. GREENHILL

Panek, O.: The Course of Labor in Adolescents. Med. Klin. 25: 376, 1929.

The author reviewed the labors of all patients sixteen years of age or less, managed from 1918 to 1927 at the First Woman's Clinic in Vienna. Among 23,828 patients, 107 or 0.45 per cent, belonged in this group. One patient was thirteen, 12 were fourteen years of age, 14 were in their fifteenth year and 80 were sixteen years old. Most of these patients had an early menarche which indicates early sexual maturity. The average duration of labor in this series was fourteen and one-half hours which is considerably less than the average for primiparas in general (in the author's clinic eighteen to twenty-four hours). This short labor is due to increased elasticity of the soft parts and to stronger powers of labor. In

only 19 of the 107 patients were the pelvic measurements normal; hence in the large majority of cases the pelvis was still in the process of growth. However, this fact had no practical significance as far as labor was concerned. A most striking phenomenon was the occurrence of only 79 full-term labors out of 107, hence 27.1 per cent of the labors were premature. All of the full-term children were born alive, whereas of the premature children two were stillborn and a third died soon after birth. There was no increase in abnormal presentations in this series, but many patients had lacerations of the soft parts. The third stage of labor was normal in all but three instances. There were three cases of eclampsia in this group. In 93 patients the puerperium was afebrile.

J. P. GREENHILL.

Pfalz: Contraceptive Silk-worm Loops as a Cause of Severe Metritis: Critical Considerations of the Value and Action of Intra-uterine Contraceptive Measures. München. med. Wehnschr. 30: 1248, 1929.

Pfalz discusses the need, under modern social conditions, of an effective, and, at the same time, harmless method of contraception. He says that none of the present methods in use are invariably effective and without danger to health. Among the newer instruments, he describes an intrauterine pessary devised by Braun and Pust, which consists of a cervical cap, made of the finest glass, to which is attached a silkworm loop covered by silk. This loop is inserted into the uterine cavity. It swells by absorption of fluid and thus retains its position. Theoretically, its action is supposed to be mechanical and chemical, the glass cap keeps most of the spermatozoa out of the uterus, while those that slip by are killed by the secretion induced by the presence of the pessary. Pfalz believes, however, that this, in common with other intrauterine pessaries, acts by interfering with the implantation and development of the ovum, i.e., it acts by inducing abortion rather than by preventing conception. He reports a case in which such a pessary was introduced. In some manner, and without the knowledge of the patient, the glass cap was lost. Later, the patient developed profuse meno- and metrorrhagia with severe lower abdominal pain and anemia. Vaginal hysterectomy was performed. Section of the specimen showed the remainder of the pessary in the cavity of the uterus. On the basis of this case, and the belief that the instrument is an abortifacient rather than a contraceptive agent, the author advises strongly against its use.

A. SHULMAN.

Danforth, W. C.: The Prevention of Neonatal Mortality from the Standpoint of the Obstetrician. Illinois M. J. 46: 166, 1929.

It is estimated that about 20,000 women and 120,000 infants are lost yearly in the United States from causes incident to pregnancy and labor. Numerous other women are left in a condition of greater or less invalidism as a result of trauma or infection. Also, injuries to infants give rise very often to individuals greatly handicapped throughout life. In the author's estimation 85 per cent of this maternal and 50 per cent of the infant morbidity is preventable. Careful prenatal observation followed by intelligent, painstaking, and conservative treatment during labor will show definite results. Infant care by the pediatrician instead of the obstetrician is urged. Results at the Evanston Hospital in 837 deliveries during the past year showed an infant mortality of 3.8 per cent.

FRANK SPIELMAN.

Smith, Lillian Richardson: Maternal Mortality in Michigan. *The Medical Woman's Journal* 36: 34, 1929.

A study of the five principal causes of death of women in each five year group from fifteen to forty years for the year 1927 was made in Michigan.

1. Between 15 and 19 years of age: tuberculosis ranks first; childbirth second; automobile accidents third; lobar pneumonia fourth and appendicitis as fifth cause.

2. Between 20 and 24: tuberculosis; childbirth; lobar pneumonia; chronic heart disease; acute heart disease as fifth and least frequent cause.

3. Between 25 and 29: tuberculosis; childbirth; chronic heart disease; lobar pneumonia; cancer.

4. Between 30 and 34: tuberculosis; childbirth; cancer; chronic heart disease; chronic nephritis.

5. Between 35 and 39: childbirth; tuberculosis; cancer; chronic heart disease; lobar pneumonia.

There were 819 cases studied, of these 78 were less than twenty; 159 were from thirty to thirty-four; 439 out of 819 were under thirty years; 166 were between twenty and twenty-four; 195 were between twenty-five and twenty-nine; 156 were between thirty-five and thirty-nine; and 65 were forty or over.

In a detailed study of 819 maternal deaths the following causes of death were ascertained: septicemia (359); convulsions and albuminuria (167); hemorrhage (95); accidents of pregnancy (79); and accidents of labor—operative deliveries or cesarean section (57).

It was found that of these 819 women dying in childbirth 447 had no care at all, only 175 regular prenatal care and 156 irregular prenatal attention.

Abortions caused 231 of the deaths (28 per cent), 181 of these being due to septicemia; in only 4 of these 231 women was abortion induced for therapeutic purpose.

Of the 819 patients dying, only 115 received good hospital care, thus many more had no hospital care at all.

Of the 359 women who died from septicemia, in 181 death occurred subsequent to abortions.

Of the 167 deaths from convulsions and albuminuria, only 33 had adequate medical care during pregnancy.

As the result of this investigation the Department of Health of Michigan has decided (1) to acquaint the medical profession with the factors entering into these deaths; (2) to send prenatal letters to all prospective mothers; (3) to conduct prenatal classes all over the state, and (4) to arrange for talks given by physicians on infant mortality and how to better their conditions.

ADAIR-LIPPMAN.

Das, Jahar Lal: Maternity and Child Welfare. *Indian M. Rec.* 49: 33, 1929.

It is now being realized by the people of India that the problem of child welfare is one of the greatest social questions of the day. The welfare of the child is inseparably associated with the welfare of the nation. If those responsible for its birth do not possess the knowledge essential for the fulfillment of their obligations to the child, it becomes the duty of the State and of society at large to interfere.

One of the most striking facts associated with human life is the extraordinary perfection commonly found in the newly born even where the mother is delicate or diseased.

It is necessary that one have a clear conception of the scope of preventive measures included in the term "child welfare." The problem of child welfare work is twofold: the health and welfare of the mother from the moment of con-

ception, and of the child before and after birth. Regarding welfare of the mother, it is to be remembered that while the function of child-bearing is a normal physiologic one, even under the most favorable circumstances it takes its toll on maternal life and health.

The question of making skilled aid available to the mother during childbirth is of paramount importance. In Western countries practically every labor case is attended by a doctor or a qualified midwife; whereas in this Eastern province by far the largest number of mothers do not receive any skilled attention during either pregnancy or labor.

Regarding mortality among children in India, 246 per 1,000, close to 25 per cent, died within twelve months of birth in 1926. The figure for Bihar and Orissa for 1926 was 147.7 and for 1927 133.4 per 1,000 live births.

Maternity and child welfare work is in its infancy in this province, but the problem is being tackled. Skilled supervision during pregnancy will no doubt prevent a large number of stillbirths; it will also ensure the birth of a larger number of healthy children, and will give that good start in life to the newborn which is so essential.

C. O. MALAND.

Heckscher, S.: The Kauffmann Diuresis Test and Its Significance as Regards Operability in Gynecology. Monatschr. f. Geburtsh. u. Gynäk. 82: 317, 1929.

The Kauffmann diuresis test is a simple clinical test of the circulatory system and is of value before operating on gynecologic patients. The prognosis is good if the elimination of fluid before and after the test measures about 300 to 450 c.c. and if the ratio before and after is between 100:100 and 100:130. If the ratio is above 100:130, the prognosis is bad. During pregnancy and menstruation the ratio is frequently above 100:130, due to the effect of the glands of internal secretion on the circulation. In gynecology the ratio is most frequently abnormal in cases of myoma of the uterus.

J. P. GREENHILL.

Kaiser, K.: Late Dehiscence of Abdominal Wounds. Monatschr. f. Geburtsh. u. Gynäk. 82: 322, 1929.

The only disadvantage of the longitudinal abdominal incision is the danger of hernia; but the presence of pus may produce a hernia regardless of whether the incision is longitudinal or transverse, and regardless of whether catgut, silk, or silkworm is used. The author reports the case of a young woman on whom a cesarean section was performed in September, 1926. On the tenth day, after having had an abscess in the abdominal wound, the wound edges separated and there was an evisceration of the viscera. The intestines and omentum were replaced, and the wound edges were approximated with bandages. The patient recovered, but a hernia remained. On October 22, 1928, two years later, the patient was suddenly awakened at 2 A.M. without any special reason. Her abdomen felt wet and she realized that the wound had ruptured and the intestines had escaped on to the abdomen. The patient was rushed to a hospital, and the intestines were replaced within the abdomen. The edges of the wound were freshened and sewed together. The wound healed by first intention, and there was no sign of peritonitis. On December 29 the hernia was repaired and again an abscess developed; but this time as well as at the time of the cesarean section it was observed that in spite of the pus, the silk sutures in the fascia held firmly.

J. P. GREENHILL.